A study to explore the risk factors for the early onset of cataract in India

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Abstract

Purpose The aim of this study was to identify risk factors for the development of cataract in young patients.

Settings The study was undertaken at Iladevi Cataract and IOL Research Centre, Ahmedabad, Gujarat, India.

Methods In a clinic-based observational study, 340 consecutive patients in the age group of 30–45 years presenting with nuclear, cortical, posterior subcapsular (PSC), mixed, and posterior polar cataract were prospectively studied. A detailed history regarding sunlight exposure, atopy, diabetes, steroid intake, myopia, glaucoma, and uveitis was elicited.

Results The mean age of the patients was 40.2 ± 4.6 years; there were 202 men. The major risk factors were atopy (25.6%), idiopathic (19.1%), high myopia (12.4%), atopy with steroid intake (10.9%), steroid usage (7.4%), sunlight exposure (3.8%), and diabetes mellitus (3.2%). PSC was observed in 53.5% eyes. Multinomial logistic regression revealed that atopy ($P = 0.016$), steroid usage ($P = 0.100$), and diabetes mellitus ($P = 0.076$) documented higher odds for PSC. High myopia ($P < 0.001$) and sunlight exposure ($P = 0.003$) documented higher odds for nuclear cataract.

Conclusion Atopy was found to be the most common risk factor associated with the development of cataract in young individuals. PSC was the predominant type of cataract prevalent in young patients.

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Introduction

Cataract has a multifactorial aetiology with genetic,¹ sociodemographic,² behavioral, and

environmental factors^{3,4} all being implicated. Although it is likely that these factors interact with each other, age is still the single most important risk factor for cataract. In India, almost 80% of blindness is attributed to cataract and there is a high prevalence of lens opacities.^{5,6} Moreover, lens opacities have an earlier age of onset in India compared with industrialized countries.^{7,8} For example, data from a study carried out in Punjab showed that the age-specific prevalence of cataract in India was three to six times higher than that in the Framingham Eye study in the United States.⁷ These findings suggest that the Indian population is either widely exposed to environmental risk factors (ultraviolet (UV) light, nutritional deficiencies, severe dehydration from diarrhoea/heatstroke) and/or there is a genetic predisposition to cataract.^{9–11} The search for modifiable risk factors that affect the occurrence of cataract has prompted investigators to explore possible links between cataract and diabetes, hypertension, body mass index, drug usage, severe dehydrational crises, gender, smoking, exposure to UV light, childbearing, and socioeconomic factors.^{1–4,10–18}

Very few studies have been undertaken to explore risk factors for presenile cataract and they indicate that nearly 50% of the participants were exposed to at least one known risk factor including trauma, intraocular inflammation, diabetes mellitus, and the use of steroids.^{19–21} We believe that it is worth investigating presenile cataract in developing countries, as this group may be exposed to potentially modifiable risk factors. For example, studies of presenile cataract in India have shown associations between severe dehydrational crises and childbearing.^{10–12,22}

The present study was undertaken to develop a methodology and study instruments that can be later used in a case-control study to explore associations between presenile cataract and risk factors among individuals aged 30–45 years.

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The study was undertaken at the Iladevi Cataract and IOL Research Centre, Ahmedabad, Gujarat, India. This centre provides comprehensive tertiary eye care and training in paediatric and adult cataract surgery. The catchment area includes Gujarat and its surrounding states (ie Rajasthan, Madhya Pradesh, Maharashtra, West Bengal, and Assam).

Materials and methods

In this prospective, clinic-based observational study, 340 consecutive patients in the age groups of 30–45 years with unilateral or bilateral morphologically similar cataract were recruited. Those with a history of intraocular surgery or ocular trauma were excluded. Informed consent was obtained from all participants. After dilating the pupils, the eyes of all the participants were examined at the slit lamp using standardized illumination and magnification. A single observer (MRP) used direct observation and retroillumination to determine the type of cataract. Cataract was categorized as nuclear, cortical, posterior subcapsular (PSC), posterior polar, or mixed cataract. The axial length (AXL) was measured 10 times in each eye using an A scan (OcuScan, Alcon) and an average value obtained. Intraocular pressures were measured by applanation tonometry and all the participants underwent a dilated fundus examination using indirect ophthalmoscopy.

An allergy specialist (GPB) developed a standardized questionnaire for this study, which was based on a questionnaire used routinely by chest physicians in the Vallabhbhai Patel Chest Institute, University of Delhi. In the present study, the atopy questionnaire was used to diagnose asthma, atopy, and allergic disorders. (Figure 1). The questionnaire included symptoms of rhinitis, itching and seasonality of itching, history of asthma, eczema, dermatitis and the age of onset, and reaction to recognized allergens such as pollen. One observer (GDS) interviewed all the participants and elicited detailed information regarding sunlight exposure, steroid intake, diabetes, myopia, and uveitis and filled out the atopy questionnaire. Those participants who reported five to six symptoms of atopy were referred to the same allergy specialist who confirmed whether they were atopic and assigned a severity score after weighting their symptoms (Figure 2). The score values ranged from 0 to 28 and the different degrees of severity were defined as follows: 0–6 no atopy, 7 mild atopy, 8–14 moderate atopy, 15–21 severe atopy, and 22–28 very severe atopy. Participants were categorized as having significant sunlight exposure if their occupation meant they spent more than 8 h a day outdoors for more than 5 days a week for more than 8–10 years. Diabetes was diagnosed based on the medical history of the

An Evaluation of Scores of Risk Factors for Atopy

	Score
1 Age of onset: (Circle one only)	☐ 1 2–12 yrs ☐ 2 12–30 yrs ☐ 3 30–45 yrs ☐ 4 >45 yrs
2 Occupation (Circle one only)	☐ 1 Indoor ☐ 2 Outdoor
3 Diet (Circle all that apply)	☐ 1 Sour food Legumes Frozen Foods Fruits
4 Respiratory tract (Circle all that apply)	☐ 1 Asthma or Rhinitis
5 Skin (Circle all that apply)	☐ 1 Eczema or Itch/Rash or Dermatitis
6 Eyes (Circle all that apply)	☐ 1 Conjunctivitis
7 Duration of Disease (Circle one only)	☐ 1 Acute ☐ 2 Chronic ☐ 3 Acute or chronic
8 Severity (Circle one only)	☐ 1 Mild ☐ 2 Moderate ☐ 3 Severe
9 Seasonal Variation (Circle one only)	☐ 1 Yes ☐ 0 No
10 Family H/O Atopy (Circle all that apply)	☐ 1 Grandparents, cousins, nieces, neph ☐ 2 Parents. Siblings, Children
11 H/O atopy in childhood	☐ 1 Yes
12 Clinical course (Circle one only)	☐ 1 Getting better ☐ 2 Static ☐ 3 Worse
13 Drug Allergy	☐ 1 Yes
14 Ass. Systemic disease	☐ 1 Diabetes
15 Onset (Circle one only)	☐ 1 Gradual ☐ 2 Sudden
16 Duration of treatment: (Circle one only)	☐ 1 < 1yr ☐ 2 1–5 yrs ☐ 3 >5yrs
Total score	7 - mild atopy 8 - 14 moderate atopy 15 - 21 severe atopy 22 - 28 very severe atopy.

Figure 1 Questionnaire to evaluate risk factors.

patient and verified against the physicians' treatment records. Steroid intake was classified as oral, inhaled, injectable, or topical used for at least 4 months. Participants were categorized as having high myopia if their AXL was more than 26 mm. Patients in whom none of the risk factors were observed were placed into a separate group called the idiopathic category.

Atopy questionnaire

1 Name	first	middle	last	Study number	
2 Date of birth	dd	mm	yy		
3 Age			years		
4 Sex		Male			Female
5 Occupation:					
6 Complaints :					
a Respiratory: (Circle all that apply)	1	Cough	3	Sputum	
	2	Shortness of breathe	4	Wheezing	
b Upper Respiratory Tract (Circle all that apply)	1	Sneezing	5	Itching eyes	
	2	Running nose	6	Itching palate	
	3	Blocked nose	7	Itching ears	
	4	Itching nose			
c Gastrointestinal (Circle all that apply)	1	Abdominal cramps after food	3	Food sensitivity	
	2	Mucus in stools/Diarrhea			
d Skin (Circle all that apply)	1	Itching/rash	2	Angio-oedema	
7 Other Complains (Circle all that apply)	1	Headache	4	Allergic rhinitis	
	2	Giddiness	5	Allergic bronchitis	
	3	Fever	6	Asthma	
8 Seasonality (Circle one only)	1	Seasonal			
	2	Perennial			
	3	Irregular			
9 Severity of symptoms: (Circle one only)	1	Severe			
	2	Moderate			
	3	Mild			
10 Indicate months when affected	Jan	May	Sep		
	Feb	Jun	Oct		
	Mar	Jul	Nov		
	Apr	Aug	Dec		

Figure 2 Atopy evaluation score.

11 If seasonal
(Circle one only)

1	Constant
2	Intermittent

12 Likely Causative Agents:

a Inhalants:
(Circle all that apply)

1	Pollen
2	House dust
3	Cotton dust
4	Paper dust
5	Wheat dust
6	House dust mite

7	Air in cellars
8	Animal dander
9	Human dander
10	Fumes
11	Perfume

b Ingestants
(Circle all that apply)

1	Food
2	Drugs
3	Chemicals
4	Soap
5	Cosmetics

6	Synthetic fibres
7	Plastic
8	Petroleum products
9	Others

c Contacts
(Circle all that apply)

1	Dyes
2	Chemicals
3	Drugs
4	Soap
5	Cosmetics

6	Synthetic fibres
7	Plastic
8	Petroleum products
9	Others

d Physical agents
(Circle all that apply)

1	Cold
2	heat
3	Fan
4	Rain

5	Smoke
6	Storms
7	Change of season

e Psychological factors
(Circle all that apply)

1	Emotional upset
2	Anger
3	Frustration

4	Anxiety
5	Depression
6	Other

f Exercise
(Circle one only)

1	Mild exercise / work
2	Moderate exercise / work
3	Heavy exercise / work

12 Investigations:

1		Eosinophil count
2		Serum IgE

Figure 2 Continued.

Multinomial logistic regression was applied taking into consideration all the risk factors to obtain the odds associated with each risk factor and to determine odds for a combination of risk factors. Using a multivariate model, we carried out further analysis using multinomial logistic regression to find an association between types of

cataract and various risk factors (Table 3). Patients with mixed and cortical cataract were combined into a single category representing 'other types,' and we compared the influence of risk factors on nuclear cataract, PSC, and posterior polar cataract using these 'other types' as a reference category. This exercise was attempted to find

Table 1 Distribution of exposures

Risk factor	N	%
<i>Atopy alone or with other exposures</i>		
Atopy (of any type) alone	87	25.6
Atopy (of any type) + steroids	37	10.9
Atopy (of any type) + UV light	8	2.4
Atopy (of any type) + myopia	7	2.1
Atopy (of any type) + diabetes mellitus	10	2.9
Atopy (of any type) + steroids + myopia	6	1.8
Atopy (of any type) + UV light + steroids	1	0.3
Family history of atopy	7	2.1
Family history of atopy + glaucoma	1	0.3
Subtotal	164	48.2
<i>Other exposures</i>		
Steroids	25	7.4
UV light	13	3.8
Diabetes mellitus	11	3.2
Family history of cataract	4	1.2
Uveitis	4	1.2
Family history of cataract + steroids + uveitis	4	1.2
Glaucoma	2	0.6
Glaucoma + uveitis	2	0.6
Subtotal	65	19.1
Idiopathic	65	19.1
Other risk factors	46	13.5
Total	340	100.0

risk factors associated with nuclear cataract, PSC, and posterior polar as compared with the 'other types' mentioned above. The category 'other types' was used as a reference as these types of cataract rarely occur in young patients thereby making it an ideal choice for use as a reference category.

Results

The total study population was 366 patients. Of 366 patients, 290 had bilateral cataract and 76 had unilateral cataract. Of 290 patients, 264 had bilateral similar cataract but only one eye of each patient was randomly selected for the study. Further 26 patients with bilateral dissimilar cataracts were excluded from the study. So the final study population comprised 340 eyes of 340 patients. All these patients were distributed into all the above-mentioned categories based on the risk factors identified in them. Of the 340 patients, 202 were men and 138 were women. The mean age of the study population was 40.28 ± 4.65 years. The distribution of risk factors in the present study is shown in Table 1. Atopy was the single most common exposure followed by idiopathic (65, 19.1%). Atopy was found in 87 (25.6%) patients and it was judged as the dominant risk factor for cataract. A history of atopy was reported by 164

participants (48.3%) either alone (87, 25.6%) or in combination with other exposures (77, 22.7%) (Table 2). Asthma and allergic dermatitis were the most common forms of atopy (Table 2).

In the present study, overall 33 patients were categorized into mild atopy whereas 57 patients were with moderate, 49 with severe, and 25 with very severe degree of atopy. The other risk factors documented in decreasing order were idiopathic in 65 (19.1%) patients, high myopia in 42 (12%), atopy with steroid-induced cataract in 37 (10.9%), steroid-induced cataract in 25 (7.4%), sunlight exposure in 13 (3.8%), and diabetes mellitus in 11 (3.2%). In the study population, the most common type of cataract predominantly observed was PSC in 182 (53.5%) eyes followed by nuclear cataract in 71 (20.9%), mixed cataract in 57 (16.8%), and posterior polar cataract in 30 (8.8%). The distribution of cataract with other risk factors using different combinations is described in Table 3. In the atopy category, PSC was predominant in 49 (56.3%) eyes whereas in the idiopathic category it was found in 36 (55.4%) eyes. PSC was predominant in 33 (89.2%) eyes with atopy on steroid intake and in 11 (44%) eyes with steroid-induced cataract for various reasons. In eyes with PSC and mixed lens opacities, atopy was the most common associated risk factor (in 49 eyes, 56.3%), whereas in eyes with nuclear cataract, myopia was the most common risk factor (38.5%). In most cases posterior polar cataract was idiopathic (40%), whereas in patients in the idiopathic category, PSC and posterior polar cataract were most common. Using a multivariate model, we carried out further analysis using multinomial logistic regression to find an association between types of cataract and various risk factors (Table 3). The mixed and cortical cataracts were merged into a single category representing 'other types', and we compared the influence of risk factors against nuclear cataract, PSC, and posterior polar. Atopy

Table 2 Types of atopy in participants confirmed as atopic

	N	%
Asthma	25	15.2
Allergic dermatitis	25	15.2
Allergic conjunctivitis	18	11.0
Atopic rhinitis	12	7.3
Food allergy	12	7.3
Drug allergy	10	6.1
Cloth allergy	3	1.8
Allergic conjunctivitis + rhinitis	22	13.4
Allergic dermatitis + rhinitis	18	11.0
Allergic conjunctivitis + dermatitis	9	5.5
Asthma + dermatitis	5	3.1
Dermatitis + rhinitis + conjunctivitis	5	3.1
Total	164	100

Table 3 Association between atopy and other risk factors based on the type of cataract

	PSC		Nuclear		PP		Mixed		All	
	N	%	N	%	N	%	N	%	N	%
Idiopathic	36	19.8	6	8.5	12	40.0	11	19.3	65	19.1
<i>Atopy confirmed</i>										
Atopy alone	49	26.9	9	12.7	11	36.7	18	31.6	87	25.6
Atopy + steroids	33	18.1	1	1.4	0	0	3	5.3	37	10.9
Atopy + diabetes	6	3.3	0	0	2	6.7	2	3.5	10	2.9
Atopy + UVL	3	1.6	5	7.0	0	0	0	0	8	2.4
Atopy + myopia	2	1.1	5	7.0	0	0	0	0	7	2.1
Atopy + steroids + myopia	2	1.1	4	5.6	0	0	0	0	6	1.8
Atopy + UVL + steroids	0	0	1	1.4	0	0	0	0	1	0.3
Family history of atopy	4	2.2	0	0	0	0	3	5.3	7	2.1
FHA + glaucoma	1	0.5	0	0	0	0	0	0	1	0.3
Subtotal	100	54.9	25	35.2	13	43.3	26	45.6	164	48.2
<i>No atopy</i>										
Myopia	8	4.4	25	35.2	4	13.3	5	8.8	42	12.4
Steroids	11	6.0	4	5.6	0	0	10	17.5	25	7.4
UVL	5	2.7	4	5.6	0	0	4	7.0	13	3.8
Diabetes	7	3.8	3	4.2	1	3.3	0	0	11	3.2
FHC	4	2.2	0	0	0	0	0	0	4	1.2
FHC + steroids + uveitis	4	2.2	0	0	0	0	0	0	4	1.2
Uveitis	4	2.2	0	0	0	0	0	0	4	1.2
Myopia + glaucoma	0	0	2	2.8	0	0	0	0	2	0.6
Steroid + myopia	0	0	2	2.8	0	0	0	0	2	0.6
Glaucoma	2	1.1	0	0	0	0	0	0	2	0.6
Glaucoma + uveitis	1	0.5	0	0	0	0	1	1.8	2	0.6
Subtotal	46	25.3	40	56.3	5	16.7	20	35.1	111	32.6
Total	182	100	71	100	30	100	57	100	340	100

DM, diabetes mellitus; FHA, family history of atopy; FHC, family history of cataract; mixed, a combination of nuclear + cortical + posterior subcapsular cataract; PP, posterior polar; PSC, posterior subcapsular cataract; UVL, ultraviolet light.

documented higher odds for PSC ($P=0.016$) attaining statistical significance compared to 'other types'. Steroid-induced cataracts ($P=0.100$), diabetes ($P=0.076$), and uveitis ($P=0.121$) also documented higher odds for PSC but did not attain statistical significance compared to 'other types'. The idiopathic category showed increased odds for both PSC ($P=0.038$) and posterior polar ($P=0.203$); however, the impact of occurrence of posterior polar in the idiopathic group was stronger than the impact of PSC cataract. High myopia ($P<0.001$) and UV light exposure ($P=0.003$) expressed increased odds for nuclear cataract when compared to 'other types' attaining statistical significance. (Table 4).

Discussion

There is a paucity of peer-reviewed literature on risk factors for presenile cataract in India. A case-control study carried out in India indicated a strong association between dehydrational crises and presenile cataract.²² On the basis of these observations, it was concluded that childbearing may substantially increase the risk of

cataract among women of childbearing age in India.¹² Because a few studies^{12,19,20} have already been carried out on the risk factors for cataract in young individuals, this preliminary communication has attempted to describe the risk factors associated with various types of cataract in individuals below 45 years.

In our present study, multiple risk factors were responsible for cataract formation. Cases with more than one risk factor for the development of cataract were placed in all the appropriate categories of this study. Even though other categories were possible based on different combinations of risk factors, they were ignored because very few patients fell into those categories. In the present study, to avoid the correlation effect, we have randomly recruited only one eye of each patient with bilateral similar cataract. Further we had to exclude patients with bilateral dissimilar cataract so as to avoid any overlap of the impact of risk factors on the development of cataract.

In our study, a surprisingly high proportion of participants were diagnosed as atopic, and atopy was more frequent among those with PSC cataract. Some

forms of atopy such as atopic dermatitis^{23–28} can be complicated by cataract, but the association between atopy and presenile cataract has not yet been studied in developing countries. Although the causes of atopic dermatitis are unknown, cataract can develop and progress during periods when the dermatitis is active^{24,25} and lens opacities are often associated with severe manifestations of this disease.^{24,25} In a study from Japan, 19 (12.4%) of 153 young adults with atopic dermatitis had cataract.²³ In another study, authors reported that 10–25% of patients with atopic dermatitis had early onset of cataract that often occurred during exacerbations of the disease.²⁹ In another study, 25% of patients with atopic dermatitis had cataract, with PSC cataract being the most common type (50%) followed by anterior subcapsular cataract (25%) and total opacities (12.5%).^{30,31} These authors also noted rapid progression of cataract during periods when the skin disease was active.^{29,30} A breakdown of the blood–aqueous barrier and frequent eye rubbing may also be contributory factors.^{32,33} A literature review of population-based studies on risk factors for cataract has failed to reveal atopy as a risk factor for the development of cataract even in young and age-related cataract. Although the atopy questionnaire

used in this study has not been validated against other indicators of allergy (eg IgE and eosinophilia), all the participants reporting symptoms were interviewed and examined by an allergy specialist who confirmed the diagnosis. To our knowledge, only one validated atopy questionnaire has been reported in literature that was designed for alopecia and eczema.

In our study, only 19.1% of the participants did not report any of the risk factors we explored. We reported similar observations in an earlier prospective study of 150 consecutive patients with presenile cataract.³⁴ In the present study, high myopia was also an important risk factor. In the young patients with cataract studied here, it was observed that nuclear sclerosis was the most frequent subgroup of high myopia. Similar findings have been reported from Taiwan where an AXL of >27 mm was associated with an increased risk of cataract in individuals below 45 years.³⁵ In another report, the authors described discrete nuclear sclerosis in young subjects with axial myopia as the cause of unexplained visual loss.³⁶

Compared with other studies,^{37,38} we found that corticosteroid usage (either topical, oral, or systemic) was more frequent in our study population and in almost half

Table 4 Odds ratio associated with each risk factor by type of cataracts

	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>d.f.</i>	<i>Sig.</i>	<i>Exp. (B)</i>	95% <i>CI</i>	
							<i>Lower bound</i>	<i>Upper bound</i>
<i>PSC</i>								
Atopy	1.139	0.471	5.837	1	0.016*	3.124	1.240	7.871
Steroid	0.764	0.464	2.712	1	0.100	2.148	0.865	5.334
Idiopathic	1.299	0.625	4.317	1	0.038*	3.665	1.076	12.482
Myopia	0.690	0.700	0.971	1	0.325	1.993	0.505	7.861
Diabetes	1.549	0.872	3.156	1	0.076	4.708	0.852	26.011
Uveitis	1.794	1.157	2.406	1	0.121	6.015	0.623	58.075
UV light	0.382	0.746	0.262	1	0.609	1.465	0.339	6.322
<i>NC</i>								
Atopy	0.842	0.562	2.246	1	0.134	2.321	0.772	6.981
Steroid	0.604	0.601	1.008	1	0.315	1.829	0.563	5.939
Idiopathic	1.115	0.821	1.846	1	0.174	3.051	0.610	15.245
Myopia	3.536	0.742	22.70	1	0.000*	34.325	8.016	146.980
Diabetes	1.835	1.054	3.031	1	0.082	6.262	0.794	49.392
Uveitis	−17.88	0.000		1		1.704E−08	1.704E−08	1.704E−08
UV light	2.357	0.796	8.776	1	0.003*	10.556	2.220	50.190
<i>PP</i>								
Atopy	0.920	1.044	0.777	1	0.378	2.510	0.324	19.432
Steroid	−19.852	8994.22	0.000	1	0.998	2.389E−09	0.000	0.000
Idiopathic	1.504	1.181	1.623	1	0.203	4.501	0.445	45.520
Myopia	1.174	1.176	0.997	1	0.318	3.235	0.323	32.409
Diabetes	1.495	1.168	1.637	1	0.201	4.457	0.452	43.995
Uveitis	−16.947	0.000	0.000	1	0.000	4.366E−08	4.366E−08	4.366E−08
UV light	−18.827	0.000	0.000	1	0.000	6.660E−09	6.660E−09	6.660E−09

NC, nuclear cataract; PSC, posterior subcapsular cataract; PP, posterior polar. Multinomial logistic regression using 'others cataracts' as reference category.

**P* < 0.05 is statistically significant.

the population this was associated with other exposures under study. In the present study, consumption of steroids for as little as 4 months was scored. We did not attempt to validate drug consumption. The usual methods of testing drug consumption such as blood and urine tests were not feasible in this case because our interests extended to drugs taken in the past. Validations were done either from the hospital records or from the general practitioners' notes. PSC cataract was the predominant type of cataract in the present study, which was similar to the observations made in other studies.^{37,38} Steroid compounds including topical drops, pills, and inhalers have been associated with significantly increased risk for lens opacity.^{37,38}

Diabetes mellitus was diagnosed in 3.2% of participants, which may reflect the increasing incidence of diabetes in India. In our present study, PSC was predominant with diabetes mellitus. Similar observations on the association between diabetes and PSC have been reported in other studies.^{39–41} The function of UV light in the aetiology of cataract is controversial and difficult to study. In our study, only a minority of participants had an outdoor occupation. Lens opacification has been linked to ocular exposure to UV radiation particularly UV B.⁴² Few authors^{43,44} found a positive correlation between cataract prevalence and duration of sunlight exposure. In the present study, PSC followed by nuclear cataract was documented in patients experiencing occupational exposure to sunlight. However, we do not have sufficient data on the range of ocular exposure to determine the magnitude of any increase in the risk of incurring cataract. Further work in this area is clearly warranted.

Some of the limitations of this pilot study are that we did not use LOCS III or other recognized systems to classify and grade lens opacities. Further family histories of atopy were not validated and inquiries were not made about alcohol intake, smoking habits, or the socioeconomic status of the participants. The details of visual acuity were not documented. Further the patients did not have a cycloplegic refraction. There was no control group. The other limitation of this study is the absence of genetic evaluations. Finally, being a referral centre for cataract surgery, a greater number of patients may have visually significant cataract, even during the first examination. Consequently, there may be a higher number of patients with PSC. Other population-based studies may have different prevalence rates of cataracts.

In conclusion, we determined that a high proportion of individuals with presenile cataract were atopic. PSC cataract was the predominant type of cataract prevalent. PSC cataract had a stronger association for all the risk factors except for high myopia where nuclear cataract was predominant. On the basis of these findings, we will

subsequently carry out a case-control study that will include other known risk factors for cataract (ie body mass index, smoking history, socioeconomic status) that may confound any association between atopy and cataract.

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