

## Original Research Article

## Acquired cataract in individuals of age 25 – 45 years: it's risk factors

Sravani Lakshmi Kota<sup>1</sup>, Konuganti Prakriti Yagnam<sup>2</sup>, Poluri Swarna latha<sup>3</sup><sup>1,3</sup>Assistant Professor, Department of Ophthalmology, Katuri Medical College, Chinakondrupadu, Guntur, AP, India<sup>2</sup>Post Graduate, Department of Ophthalmology, Katuri Medical College, Chinakondrupadu, Guntur, AP, India.

Received: 24-09-2021 / Revised: 29-10-2021 / Accepted: 29-11-2021

**Abstract**

**Purpose:**To study the risk factors of acquired cataract in individuals of age 25 – 45 years and to evaluate the type of cataract. **Methods** - The present study was a cross-sectional study. It was intended at documenting the risk factors for the development of early age cataracts. In this study, all the patients in the age group of 25-45 years with unilateral and bilateral diminished vision who are diagnosed as cataracts are recruited and history evaluated for any possible risk factors and eye examination done to know the type of cataract. **Results** :Among 100 patients taken into the study, there were 69 females (69 %) and 31 males (31 %). 92 patients (92 %) had bilateral cataracts and 8 patients (8%) had unilateral cataracts. The prevalence of cataracts was high in the age group between 39 – 45 years (67 %). UV exposure was statistically significant with cortical cataracts and PSC with p values < 0.000023 (p < 0.05 is significant) and not significant with nuclear and mixed cataracts. Atopy was also statistically significant for cortical cataracts and PSC with p-value at < 0.00484. Steroid exposure was statistically significant for PSC with p-value < 0.00001. Other risk factors like trauma, diabetes, smoking, uveitis, glaucoma were low to be calculated statistically when taken individually and can be considered as associated factors with atopy and steroids and UV exposure being the dominant risk factors. **Conclusion**- The prevalence of cataract was higher in the age group between 39-45 years with male to female ratio of 1:2.2. UVB exposure, atopy, steroids, smoking, trauma and glaucoma were the probable risk factors with UV exposure, atopy and steroid intake being dominant

**Keywords** : Cataract, young individuals, UV exposure, atopy, steroid intake

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

**Introduction**

Human lens is a transparent, crystalline, biconvex structure placed between iris and vitreous in the patellar fossa. Its main role is in transmission of light rays and focusing mechanism for vision. The normally transparent lens undergoes many biochemical changes with increased age like decreased synthesis and denaturation of proteins causing hydration of lens leading to cataract formation. Multiple etiological factors acting singly or in combination play in the development of acquired cataract. However age is the most important risk factor among others. Senile or age related cataract is the commonest type of acquired cataract affecting equally persons of either sex above 50 years usually. But when it occurs in young adults it affects the standard of living of the individual and thereby the per capita income and the gross national income of the country. So, the need to identify the modifiable risk factors and steps to prevent them have become a necessity. This might modify or delay the onset and progression of the disease, which will have an impact on the individual and also the society.

**Objectives** :To document various risk factors that cause cataract in individuals of age 25– 45 years; To evaluate the type of acquired cataract in

**Materials and methods**

Both males and females were included in the study

Study setting: Department of Ophthalmology, Katuri Medical College and Hospital Study Period: 2 years (November 2018 – October 2020) Study sample: 100

**The present study was a cross-sectional study for which ethical approval** was obtained from the ethics review board of the hospital. In this study, all the patients in the age group of 25-45 years with unilateral and bilateral diminished vision who were diagnosed as cataracts were recruited after taking their written consents. A detailed systemic and ocular history was evaluated for any possible risk factors and type of cataract was noted.

**Inclusion criteria:**

1. Patients between age 25 to 45 years
2. Patients with a family history of early cataract, history of

\*Correspondence

**Dr. Poluri Swarna latha**

Assistant Professor, Department of Ophthalmology, Katuri Medical College, Chinakondrupadu, Guntur, AP, India.

**Email:** [drswarnariniwas@gmail.com](mailto:drswarnariniwas@gmail.com)

inflammation of eye-ball, exposure to UV light and other risk factors

**Exclusion criteria :**

1. Congenital and developmental cataract
2. Pregnant women

**Methodology**

The present study was a cross sectional study.

Patient history including age, gender, occupation and other demographic details were collected.

Symptoms were noted.

Visual acuity was noted.

Slit-lamp examination was done using standardized illumination and magnification. Direct and retro illumination was used to determine the type of cataract and graded according to the LOCS 3 classification. The lens changes were noted as (1) Cortical which includes immature, mature and hypermature cataracts; (2) Nuclear which includes all grades of nuclear cataracts; (3) Capsular including posterior subcapsular and posterior polar cataracts; (4) Mixed which includes combinations of any of the above three; (5) Clear lens without any opacification. Other preoperative investigations include intraocular pressure measurement by Goldmann applanation tonometry, nasolacrimal duct syringing for patency of nasolacrimal ducts, xylocaine sensitivity with 2 % xylocaine. Keratometry and A-scan were carried out, and the corneal curvature and axial length were measured respectively with Bausch and Lomb keratometer and A-scan biometry.

The pupil was dilated, and fundus examination was done to note the posterior segment changes using slit-lamp biomicroscopy with 78 D or 90 D lens. Systemic investigations include blood pressure and random blood sugars measurement. Exposure to risk factors was elicited using questionnaires.

UV exposure was taken as positive if the patient was exposed to sunlight for more than eight hours, for a minimum of six days a week for more than ten years. An atopy questionnaire was used to elicit any bronchial asthma or skin or food or other types of allergies and was further confirmed by an antigen-specific immunoglobulin E. Diabetes was confirmed by history and if there is a raised random blood glucose levels, diagnosis was made based on fasting and postprandial blood sugar levels and HbA1C levels.

**Results**

Among 100 patients taken into the study, there were 69 females (69 %) and 31males (31 % ). 92 patients (92 %) had bilateral cataracts and 8 patients (8% ) had unilateralcataracts.

The axial lengths and keratometry readings of all patients are within the normalrange. Blood pressure and blood sugars were under control.

**Table 1: Demographic data regarding age, sex and occupation**

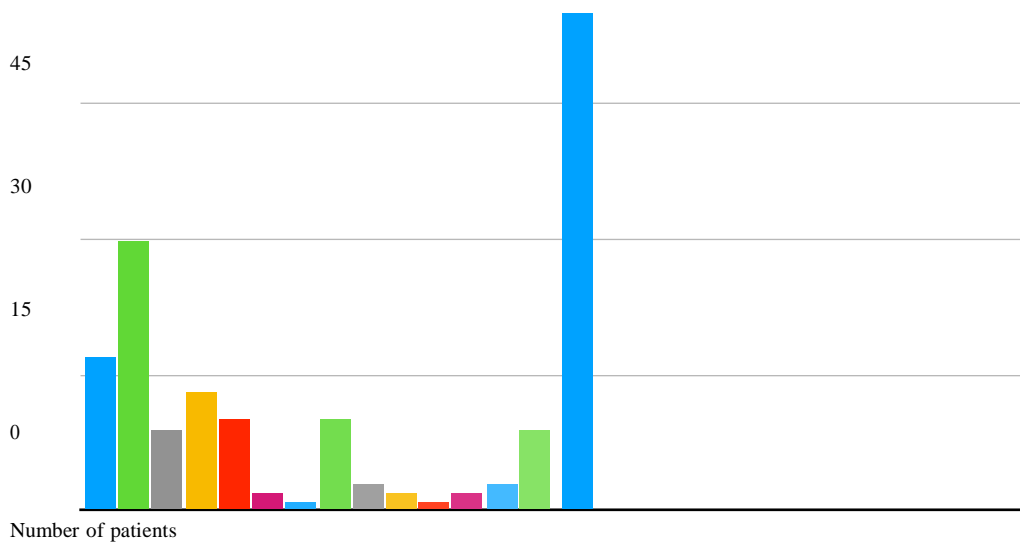
Demographic data	Percentage (n=100)
Mean age	38.2
Males	31
Females	69
Male:Female	1:2.2
Farmers	10
Field workers	14
Manual laborers	14
Teachers	10
Officers	3
Shopkeepers	17
Housewives	30
Students	2

**Table 2: Number of patients and percentages in each age group**

Age group	Number of patients	Percentage (%)
25-31 years	10	10
32-38 years	23	23
39-45 years	67	67
<b>Total</b>	<b>100</b>	<b>100</b>

**Table 3 :Male and female patients in each age group**

Age group	Number of malepatients	Percentage (%)	Number of fe-male patients	Percentage (%)
25-31 years	1	3.22	8	11.5
32-38 years	4	12.9	19	27.5
39-45 years	25	80.6	42	60.8
<b>Total</b>	<b>31</b>	<b>100</b>	<b>69</b>	<b>100</b>



**Fig 1: Number of patients exposed to risk factors in the percentage(Number of patients Vs risk factors)**

● IMCC ● MCC ● HMCC ● PSC ● Nuclear ● Mixed ● Clear

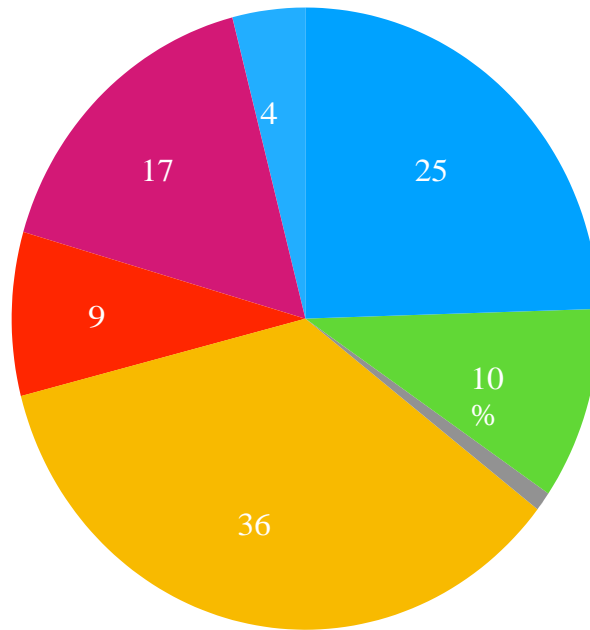
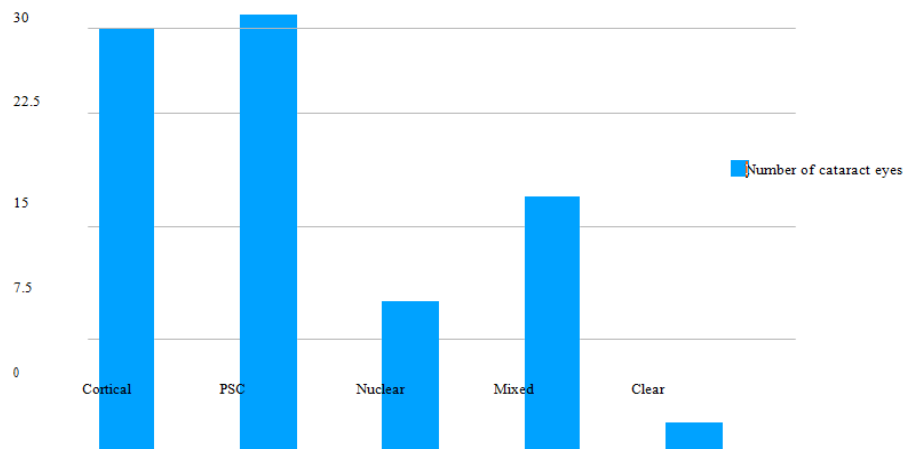


Fig 2: Different cataract types seen in the present study



For cortical cataracts and PSC Chi square = 17.931 , p < .000023 - Significant Nuclear cataracts and mixed Chi square = 2.5671 , p = .1 - Not significant

Fig 3: A bar graph showing number and type of cataract in eyes with UV exposure

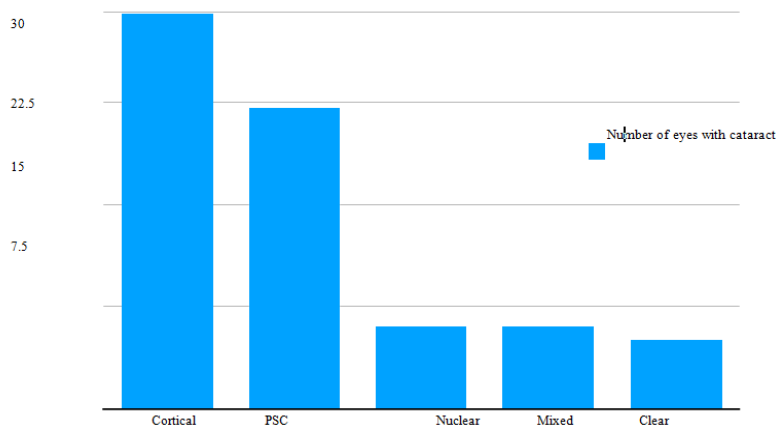


Fig 4:A bar graph showing number and type of cataracts in eyeswith atopy

For cortical cataracts and PSC Chi square = 12.1752 , p < .00484 - Significant For nuclear and mixed cataracts Chi square = 3.3489 , p = .067 - Not significant

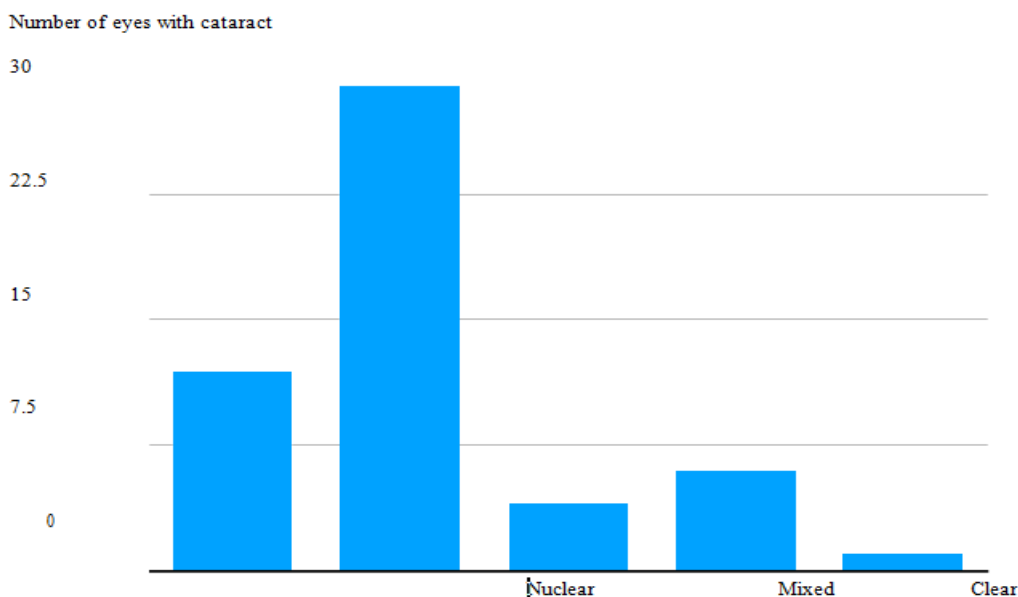


Fig 5: A bar graph showing number and type of cataracts in eyeswith steroid exposure

For Cortical cataracts Chi square = 0.5514 , p value = .457 - Not significant For PSC Chi square = 7.0225 , p value = .008 – Significant For nuclear and mixed Chi square = 0.6061 , p value = .43 - Not significant

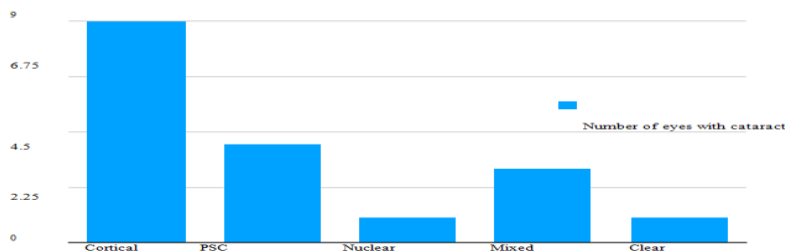


Fig 6:A bar graph showing number and type of cataracts with idio-pathic cause

For cortical cataracts Chi square = 1.2294 , p value = .267 - Not significant For PSC Chi square = 2.8496 , p value = .09 - Not significant Others Chi square = 0.2164 , p value = .641 - Not significant

### Discussion

The present study was conducted to determine the risk factors and types of cataract in young adults between 25 to 45 years of age. It was a cross-sectional retrospective study. UV exposure was identified as a sole risk factor in 43 % of cases, but the association was not statistically significant. Exposure to sunlight for more than eight hours for a minimum of six days per week was considered significant. In these patients, the incidence of PSC cataracts was observed more next only to cortical cataracts which were statistically significant. The studies which correlated UV exposure with cataract formation are Chesapeake bay study in which nuclear cataracts were higher (27%) followed by cortical (13%) and PSC (2%) and Maryland study which showed an association of PSC with UV exposure similar to the present study.[1,2]

Atopy, combined with other factors, was shown to be the second most common risk factor in this study. 9 % of patients had atopy as the only risk factor. On the whole, about 34 % of patients were proved to be atopy positive which was confirmed by laboratory examination. Idiopathic atopic dermatitis associated with early cataract formation was reported by many studies with cataract progression during active phases of the disease like Uehara et al. which showed 12.4% of patients with atopic dermatitis had cataract. Nagabi et al. showed 24.4% of patients with atopic dermatitis had progression of cataract. Vasavada et al. showed 30.6% patients with atopy had PSC[4,5].

Steroid exposure was found in 26 % of patients. Continuous steroid usage in any form for more than six months was considered as a risk factor. The total dosage could not be found out as it was a cross-sectional study. PSC was the common type of cataract seen in these patients. Similar results were seen in other studies like S.J Crew in which 48.07% of patients on long term steroid exposure had PSC[6].

### Conclusion

Blindness is economically and emotionally devastating and causes human suffering. Many surveys conducted in India projected that 8.25 million people would be affected by cataract by 2020. The treatment now available for cataract is surgical extraction only, and it is not always sight-restoring. So measures which may help to prevent or delay the progression of cataract are very necessary especially in younger age group. As UV exposure was shown to be a sole risk factor in 43 % of patients reducing this exposure may prevent the early onset of cataract formation. This can be done by using UV – protected sunglasses and use of UV absorbing hydrogel polymers and wearing hats which prevents direct exposure of UV B rays to the eye. Use of antioxidants like Vitamin C, E, thiamin, riboflavin, lutein, flavonoids, carotenoids is shown to effectively prevent and cure protein oxidation caused by UVB rays and also photo peroxidation of lipids in the lens. These may delay the early onset of cataractous changes in people exposed to chronic UVB radiation[7-9]. Other preventive measures include prescribing alternate medications if possible for steroid and other drugs, known to cause cataract so that the changes can be prevented to some extent.

### References

1. Brilliant LB, Grasset NC, Pokhrel RP, Kolstad A, Lepkowski JM, Brilliant GE, et al. Associations among cataract prevalence, sunlight hours, and altitude in the Himalayas. *Am J Epidemiol* 1983;22
2. Klein BE, Lee KE, Danforth LG, Schaich TM, Cruickshanks KJ, Klein R. Selected sun-sensitising medications and incident cataract. *Arch Ophthalmol*. 2010;128(8):959–963.
3. Uehara M, Amemiya T, Arai M. Atopic cataracts in a Japanese population. With special reference to factors possibly relevant to cataract formation. *Dermatologica* 1985;170:180-4.
4. Nagaki Y, Hayasaka S, Kadoi C. Cataract progression in patients with atopic dermatitis. *J Cataract Refract Surg* 1999;25:96-9.

5. Vasavada AR, Mamidipudi PR, Sharma PS. Morphology of and visual performance with posterior subcapsular cataract. *J Cataract Refract Surg* 2004;30:2097-104.
6. Chen SN, Lin KK, Chao AN, Kuo YH, Ho JD. Nuclear sclerotic cataract in young patients in Taiwan. *J Cataract Refract Surg* 2003;29:983-8.
7. Age-Related Eye Disease Study Research Group (AREDS). A randomised, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E and beta carotene for age-related cataract and vision loss: AREDS report no. 9. *Arch Ophthalmol*. 2001;119(10): 1439–1452.
8. Berendschot TT, Broekmans WM, Klöpping-Ketelaars IA, Kardinaal AF, Van Poppel G, Van Norren D. Lens aging in relation to nutritional determinants and possible risk factors for age-related cataract. *Arch Ophthalmol*. 2002;120 (12):1732–1737.
9. Chew EY, SanGiovanni JP, Ferris FL et al.; Age-Related Eye Disease Study 2 (AREDS2) Research Group. Lutein/zeaxanthin for the treatment of age-related cataract: AREDS2 randomised trial report no. 4. *JAMA Ophthalmol*. 2013;131(7):843–850.

**Conflict of Interest: Nil**

**Source of support: Nil**