# Profile of Presenile Cataract in Karnataka

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## Abstract

**Aim:** To describe the demographic profile and risk factors of patients presenting with presenile cataract in Karnataka, India.

**Methods:** 200 eyes of Hundred patients were included in this prospective study conducted between January 2020 to May 2020. A thorough history was taken for all followed by a detailed anterior and posterior segment evaluation using Slit lamp, Indirect ophthalmoscopy and B-Scan respectively. Results were tabulated and statistical analysis was done.

**Results:** The mean age of our study population is 44.57 years. 78% were in the age group of 41-50%. 37% were males. PSC is the most common cataract in our study followed by Combined cataract. Bilateral cataracts were significantly more in females than males ($p < 0.023$). The most common Risk factor in males is smoking and it is statistically significant ($p < 0.0001$) whereas in females is unidentified (idiopathic) ($p < 0.0001$). Smoking and idiopathic etiology were found to be associated with NS( Nuclear Sclerosis) cataract whereas the steroid usage with PSC, with their higher odds ratio. Trauma and recurrent uveitis have higher odds for mature cataract. DM has higher odds for Mature cataract. 20% had associated abnormalities.

**Conclusion:** PSC is the most common cataract type and idiopathic origin is the most common etiological factor. Presenile cataract can have multiple risk factors therefore a detailed knowledge of each risk factor is necessary to ensure good treatment as well as prevention.

*Keywords: Presenile Cataract; Smoking; Recurrent Uveitis; Trauma; PSC*

## Introduction

Globally cataract is the leading cause of blindness, accounting for 47.8% of the total blindness [1]. Presenile cataract is defined as the onset of lens opacity after the age of 18 years and before 50 years of age [2]. In India senile cataract starts appearing at the age of 30 years and thereafter steadily increases with prevalence of 13 - 36% [2]. It has also been shown that Indians develop cataract at a comparatively early age than as is depicted in the Framingham Eye Study done in the United States of America [2]. Various etiological factors have been attributed to the development of presenile cataract like environmental factors, habits, genetics, trauma and systemic risk factors [3].

## Aim of the Study

This study aims to describe the various sociodemographic factors, risk factors, types of cataract and associated abnormalities in a rural/ urban Karnataka population of India.

## Materials and Methods

Hundred patients aged 18 to 50 years with cataract, attending the outpatient department of our hospital from January 2020 to May 2020 were included. The study was done following the declarations of Helsinki. After obtaining the informed consent, a thorough ophthalmic evaluation was done for all thorough ophthalmic evaluation was done for all. The questionnaire that we followed to elicit their sociodemographic profile and etiology is summarized in table.

| | |
|---|---|
| Name: | MRD No: |
| Age: | Address: |
| Sex: | Occupation: |
| Chief Complaint: | |
| History: | |
| Systemic illness: HTN/DM/Asthma/TB/ Immunological disorders/ Skin disorders. | |
| Medication history: Systemic/Topical. | |
| Ocular history: Previous surgery; Ocular trauma; Ocular diseases. | |
| Habits: | |
| Anterior Segment findings: | |
| Posterior Segment findings: | |

***Table***

In cases of mature cataract, B-Scan was done to record the retinal findings. Fisher's exact test and Odd's ratio were used for the statistical analysis and done using SPSS software.

## Results

The mean age of the study population was 44.57 years (range: 18 - 50 years). There were 37 male patients. 78% were in the age group of 41 - 50 years (Figure 1).
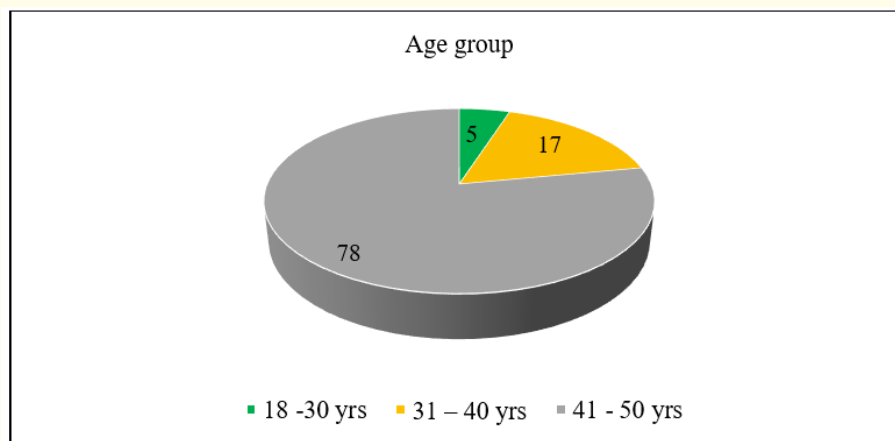


**Figure 1:** *Age distribution in the study.*

Posterior subcapsular cataract (PSC) was the most common type of cataract followed by mixed cataract (PSC+NS+Cortical cataract), nuclear sclerosis (NS) and mature cataract. Brown cataract and Hypermature cataract were least common in this study (Table 1).

Gender wise distribution of cataract (Table 1) denoted that PSC was common in females though it was not statistically significant.

| Cataract type | Gender | | P value |
|---|---|---|---|
| | Male (Eyes) | Female (Eyes) | |
| PSC | 20 (27.0%) | 49 (38.9%) | 0.0931 |
| Nuclear sclerosis | 16 (21.6%) | 24 (19.0%) | 0.7155 |
| Mature cataract | 11 (14.9%) | 18 (14.3%) | 1.0000 |
| Hypermature | 0 (0.0%) | 1 (0.8%) | 1.0000 |
| Mixed cataract | 18 (24.3%) | 29 (23.0%) | 0.8638 |
| Brown cataract | 2 (2.7%) | 2 (1.6%) | 0.6276 |

*Table 1: Gender wise distribution of cataract.*

Bilateral cataracts (90%) were found to be more common than unilateral cataract. Bilateral cataracts were also found to be common in females (95.5%) than males.

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*Table 2: Gender wise distribution of cataract.*

| | Unilateral cataract | Bilateral cataract | Total | |
|---|---|---|---|---|
| Male | 7 (18.9%) | 30 (81.1%) | 37 | P value 0.023* |
| Female | 3 (4.8%) | 60 (95.2%) | 63 | |
| Total | 10 (10%) | 90 (90%) | 100 | |

*Table 3: Gender wise distribution of unilateral and bilateral cataract.*

| Etiology of Cataract | Male | Female | Total | P value |
|---|---|---|---|---|
| Trauma | 5 | 2 | 07 | 0.248 |
| RP | 2 | 0 | 02 | 0.497 |
| Recurrent uveitis | 2 | 2 | 04 | 1.00 |
| Steroid induced | 3 | 10 | 13 | 0.081 |
| Idiopathic | 6 | 40 | 46 | <0.0001* |
| DM | 4 | 6 | 10 | 0.474 |
| HTN | 1 | 1 | 02 | 1.00 |
| DM & HTN both | 0 | 1 | 01 | 1.00 |
| Smoking | 16 | 0 | 16 | <0.0001* |
| TB | 0 | 1 | 01 | 1.00 |
| Family history | 0 | 2 | 02 | 0.497 |
| Post vitrectomy | 1 | 0 | 01 | 1.00 |
| Post chemo | 0 | 1 | 01 | 1.00 |

*Table 4: Gender wise distribution of etiology of presenile cataract.*

Few patients had more than one risk factor 40 females we couldn't find a discernible cause for their cataract. Idiopathic presenile cataract was common in female patients (p < 0.0001). Smoking was the most common risk factor in males and it was statistically significant (p < 0.0001). Trauma was more common in males in this study whereas steroid induced cataract was more common in females. 2 male patients had Retinitis Pigmentosa whereas 1 female gave history of inadequately treated Tuberculosis (TB).
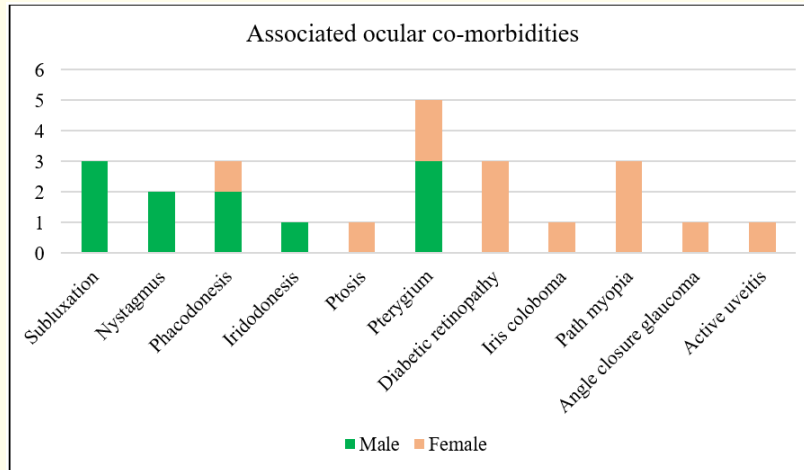


*Figure 2: Associated ocular co-morbidities in presenile cataract.*

In this study (Figure 2) 20% patients had associated ocular co-morbidities. 3 patients (2 male and 1 female) had more than one associated ocular issues.

One male patient had nystagmus and pterygium whereas the other male patient had subluxation, Phacodonesis and iridodonesis secondary to trauma. The female patient had ptosis and Phacodonesis.

| | PSC + | PSC - | NS + | NS - | Mature + | Mature - |
|---|---|---|---|---|---|---|
| Trauma + | 05 | 09 | 2 | 12 | 4 | 10 |
| Trauma - | 74 | 112 | 38 | 148 | 28 | 158 |
| OR | 0.84 | | 0.65 | | 2.25 | |
| RP + | 2 | 2 | 1 | 3 | 0 | 4 |
| RP - | 77 | 119 | 39 | 157 | 32 | 164 |
| OR | 1.545 | | 1.34 | | 0 | |
| Recurrent uveitis + | 1 | 7 | 0 | 8 | 3 | 5 |
| Recurrent uveitis - | 78 | 114 | 40 | 152 | 29 | 163 |
| OR | 0.21 | | 0 | | 3.37 | |
| Steroid + | 17 | 9 | 1 | 25 | 3 | 23 |
| Steroid - | 62 | 112 | 39 | 135 | 29 | 145 |
| OR | 3.41 | | 0.14 | | 0.65 | |

| Idiopathic + | 30 | 62 | 27 | 65 | 8 | 84 |
|---|---|---|---|---|---|---|
| Idiopathic - | 49 | 59 | 13 | 95 | 24 | 84 |
| OR | 0.58 | | 3.03 | | 0.33 | |
| DM + | 11 | 13 | 0 | 24 | 6 | 18 |
| DM - | 68 | 108 | 40 | 136 | 26 | 150 |
| OR | 1.34 | | 0 | | 1.92 | |
| HTN + | 0 | 6 | 0 | 6 | 2 | 4 |
| HTN - | 79 | 115 | 40 | 154 | 30 | 164 |
| OR | 0 | | 0 | | 2.73 | |
| Smoking + | 8 | 24 | 8 | 24 | 6 | 26 |
| Smoking - | 71 | 97 | 32 | 136 | 26 | 142 |
| OR | 0.45 | | 1.41 | | 1.26 | |

***Table 4:** Shows the odd's ratio of morphology of presenile cataract with the etiology.*

| | Hypermature + | Hypermature - | Mixed cataract + | Mixed cataract - | Brown cataract + | Brown cataract - |
|---|---|---|---|---|---|---|
| Trauma + | 0 | 14 | 0 | 14 | 1 | 13 |
| Trauma - | 1 | 185 | 47 | 139 | 3 | 183 |
| Recurrent uveitis + | 0 | 8 | 1 | 7 | 0 | 8 |
| Recurrent uveitis - | 1 | 191 | 46 | 146 | 4 | 188 |
| OR | 0 | | 0.45 | | 0 | |
| Steroid + | 0 | 26 | 4 | 22 | 0 | 26 |
| Steroid - | 1 | 173 | 43 | 131 | 4 | 170 |
| OR | 0 | | 0.55 | | 0 | |
| Idiopathic + | 1 | 91 | 24 | 68 | 0 | 92 |
| Idiopathic - | 0 | 108 | 23 | 85 | 4 | 104 |
| OR | 0 | | 1.30 | | 0 | |
| DM + | 0 | 24 | 6 | 18 | 0 | 24 |
| DM - | 1 | 175 | 41 | 135 | 4 | 172 |
| OR | 0 | | 1.09 | | 0 | |
| HTN + | 0 | 6 | 4 | 2 | 0 | 6 |
| HTN - | 1 | 193 | 43 | 151 | 4 | 190 |
| OR | 0 | | 7.02 | | 0 | |
| Smoking + | 0 | 32 | 8 | 24 | 0 | 32 |
| Smoking - | 1 | 167 | 39 | 129 | 4 | 164 |
| OR | 0 | | 1.10 | | 0 | |

***Table 6:** Odd's ratio of morphology of presenile cataract with the etiology.*

In our study population we found trauma (Table 5 and 6) to be associated with mature cataract (OR: 2.25) and brown cataract (OR:4.69). Patients on steroids were found to have PSC (OR: 3.41).

Smoking was found to be associated with NS cataract, Mature cataract and Combined cataract (PSC+NS+CC) a with Odd's ratio of 1.41, 1.26 and 1.10 respectively. Idiopathic cataracts presented as NS and Combined cataracts. NS was more likely to occur in such patients than a Combined cataract (Odd's ratio: 3.03).

Recurrent uveitis presented with mature cataract with Odd's ratio being 3.37. Patients with Diabetes were more likely to present with Mature cataract (Odd's ratio: 1.92) followed by PSC and Combined cataract.

## Discussion

The mean age of our study population is 44.57 years. This is also in coherence with the earlier studies.1,3,5 in their study reported a mean age of 41.88 years which is less than what we found [1]. Verma S., *et al*. reported the mean age of males and females to be 45.43 ± 6.79 and 47.33 ± 6.08 years, respectively in their study which is higher than the mean age of our cohort [3]. Das GK., *et al*. found the mean age of the study population to be 35.09 ± 5.78 years but they included the patients in the age group of 18 to 40 years [6]. The difference in mean age in various studies might be due to the differences in time of presentation of the patients. All these studies found cataracts are most likely to cause visual disturbance in the fourth decade of We found a female preponderance (63%) in our study which is in coherence with other studies [1-7].

In our study, 90% patients had bilateral cataract. Bilateral cataract was also the predominant mode of presentation in in various studies [3-5]. Females presented with significantly more bilateral cataract than males in this study Females have less access to eye care in our community than males. This might be the reason for their late presentation to the hospital with bilateral cataracts. The steroid induced cataracts (in inflammatory arthritis) which usually presents bilaterally are also common in females.

In the present study idiopathic presenile cataracts are more common. The cause of cataract couldn't be discerned in 46%. Here we checked for diabetes and hypertension factors alone due to which we would have missed other metabolic, endocrine and systemic conditions which also might lead to presenile cataract. Again, we didn't elicit the history of tobacco chewing, which might also lead to presenile cataract [3]. In our study cataract is also found to be more common among females. Smoking is the most common risk factor leading to presenile cataract in males. This is followed by steroid induced cataract. Idiopathic variant of presenile cataract was found to be common in various studies[1,3,4,7,8].

Praveen MR., *et al*. reported atopy to be the most common cause followed by the idiopathic variant whereas Das GK., *et al*. found trauma to be the most common risk factor of presenile cataract [5,6].

The odds of developing a mature cataract and brown cataract after trauma in our study is similar to the results obtained by Jyothi., *et al* [1]. They also found a higher association of mature cataract with steroid intake and NS cataract with uveitis. In our study steroid intake is more likely to give rise to PSC (Odd's ratio 3.41) and uveitis will lead to the development of Mature cataract (Odd's ratio 3.37). Praveen MR., *et al*. documented steroid usage with higher odds for PSC which is similar to our findings [5].

We found smoking to be the most common risk factor in males. The odds of developing a NS cataract due to smoking is found to be more than any other type of cataract (1.40). Our findings are similar to the findings of Nam SW., *et al*. in this regard [10].

The occurrence of PSC is associated with steroid usage and Mature cataract or NS cataract with recurrent uveitis.

Presenile cataract be associated with other ocular In 20% in our study which makes their management challenging and leave an impact on postoperative visual outcome. The limitations of our study being small sample size and only common risk factors were analysed. Further prospective studies with analysis of all the probable risk factors would give more insight in the causatives and preventive aspects of presenile cataracts.

## Conclusion

Presenile cataract has a wide range of etiology from medication intake, trauma to habits like smoking. From our study we conclude that in Karnataka, presenile cataracts are most likely to be bilateral, idiopathic in origin and develop in the 4th decade of life. PSC was the most common morphological type of presenile cataract and smoking being the most common risk factor in males. Though female preponderance of presenile cataracts seen in our study, the etiology could not be discerned (idiopathic) in most of them. Steroid usage has higher odds for PSC whereas trauma, uveitis, DM and smoking has higher odds for Mature cataract and NS. Idiopathic etiology has higher odds for NS cataract. is not only important for an ophthalmologist but also for any clinician to have a good knowledge about all these etiological factors so that patients can be counselled in a better manner to promote primary prevention of presenile cataract.

## Funding

None.

## Conflict of Interest

None.

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