

## Original article

# Dry eye in patients of senile cataract in hilly areas of Uttarakhand region of India

Manisha Gupta<sup>1</sup>, Tarunnum Shakeel<sup>2</sup>, Renu Gupta<sup>3</sup>

<sup>1</sup>M.S. Ophthalmology , Associate Professor, <sup>2</sup>M.S. Ophthalmology , Assistant Professor,<sup>3</sup>MBBS,Department Of Ophthalmology, Sri Guru Ram Rai Institute of Medical and Health Sciences

Corresponding author: Dr. Manisha Gupta

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### Abstract:

**Introduction:** Dry eye disease (DED) is a multifactorial syndrome that can cause visual disturbance, ocular discomfort and permanent damage to the ocular surface. Many patients with clinical signs of DED do not report significant symptoms and cataract surgery can induce or accentuate existing DED .So, DED work up should be performed and documented for all cataract patients with even mildest suspicion of DED to improve postoperative outcomes .Our aim was to determine the health of ocular surface in patients of senile cataract at high altitude in Uttarakhand region of India.

**Materials and methods:** 90 patients of senile cataract from hilly areas, aged 45-70 years with no history of corneal or conjunctival disease, intra or extra ocular surgery and any systemic disease were included in the study. Objective dry eye tests including tear film break up time (TBUT) , Schirmer's 1 test and Lissamine green staining were performed on each patient.

**Results:** Out of 90 patients of senile cataract enrolled in our study, 40 (44.40%) patients suffered from dry eye. The percentage of dry eye was more in females (57.50%) as compared to males (42.50%)

**Conclusion:** The findings of present study suggest, that the prevalence of dry eye in patients of senile cataract is more common, than has been frequently reported.

**Key words:** Dry eye disease, senile cataract.

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### Introduction:

In 2007 ,the International Dry Eye Workshop defined dry eye disease as a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface.<sup>3</sup> Several studies suggest that the prevalence of asymptomatic DED in cataract patients is high and that cataract surgery can induce or exacerbate existing DED.<sup>4,6</sup> Cataract patients with concomitant DED merit special consideration to prevent worsening of existing symptoms and making asymptomatic disease symptomatic. Ocular surface disease is often overlooked during the preoperative cataract evaluation, because the

correlation between the signs and symptoms of DED is notoriously weak. Reported prevalence of dry eye is diverse, with questionnaire based surveys documenting rates ranging from 14.4% to 33% of the population sampled.<sup>7,8</sup> There is poor clinical data regarding the prevalence and magnitude of the problem of dry eye in older population in hilly areas of Uttarakhand region of India so far. This study was taken up to determine the prevalence of dry eye in patients of senile cataract in Uttarakhand region of India and to compare it with other previous studies.

### Material and Methods:

It was a prospective randomised study carried out in a medical college at Dehradun, for a period of 8

months (October 2014 to May 2015). Ethical clearance was obtained from the review board. Patients aged 45-75 years coming to the eye OPD from hilly areas of Uttarakhand region and diagnosed with senile cataract were included in the study. Patients suffering from acute ocular infections, corneal and conjunctival diseases, those with history of any kind of intra or extra ocular surgery, systemic diseases including Diabetes Mellitus, Hypertension and Rheumatoid Arthritis and those with history of prolonged systemic or topical medication were excluded from the study. Of the 252 patients screened, 90 patients were included in the study after meeting the above criteria. All the patients were informed about the

nature of the study. A detailed history including demographic data and ocular examination was done on each patient. Ocular examination included evaluation of lid surface and meibomian glands. Then a series of objective dry eye tests (under room temperature conditions) were conducted in the following sequence: tear film break up time (TFBUT), Schirmer's -1 test and lissamine green staining ( a 5 minute gap was allowed in between the tests, to minimize reflex tearing, and ocular surface changes secondary to staining). All the above tests were evaluated based on the guidelines of the Report of The International Dry Eye Workshop (DEWS) 2007.<sup>9</sup> (Table 1 and 2)

Dry eye severity level	1	2	3	4*
Schirmer's1 test(mm/5min)	Variable	<10 mm	<5 mm	<2 mm
TFBUT(secs)	Variable	<10 secs	<5 secs	Immediate
Lissamine green staining	None to mild	Variable	Moderate to marked	Marked

Table 1: Evaluation of dry eye tests \*must have signs and symptoms

Severity	Scoring
Mild	<3
Moderate	3-4
Severe	>4

Table 2: Final Grading of Dry eyes as per the guidelines

**Results**

Out of 90 patients of senile cataract enrolled in our study, 40 (44.40%) patients suffered from dry eye. The percentage of dry eye was more in females (57.50%) as compared to males (42.50%) (Table3).

Sex	Number of dry eye pateints	Percentage(%)
Female	23	57.5
Male	17	42.5
Total	40	100

Table 3: Sex variation of percentage of dry eye (n=90) .Also the% of dry eye increased with advancing age ,showing 27.5% in the 66-70 years group (Table 4).

Age group(years)	Number of dry eye patientsn=40	(%)
45-50	5	12.5
51-55	8	20
56-60	8	20
61-65	8	20
66-70	11	27.5

Table 4: percentage of dry eye according to age (n=90) In terms of severity, mild dry eye was more common (60%) followed by moderate dry eye (32.5%). Severe dry eye was least common (7.5%).

Severity	Percentage(%)
Mild	60
Moderate	32.5
Severe	7.5

Table 5: Distribution of dry eye according to severity

**Discussion**

The prevalence of dry eye varies widely with the prevalence rates ranging from 10.8% to 57.1%<sup>1,11-12</sup> The wide disparity emerges mainly due to the different dry eye diagnostic criteria employed, and the different cut-off values for objective dry eye tests. The percentage of dry eye in our study is higher (44.4%) as compared to the previous studies conducted in various Asian countries which showed prevalence of dry eye to be 14.5% in Malaysia, 27.5% in Indonesia and 21% in Beijing (China)<sup>13-15</sup>. The high percentage of dry eye in our study could be contributed mainly by the high altitude and partly by the more number of patients in the 66-70 years age group. High altitude conditions may contribute to DED. This is further supported by studies conducted in plains of India (Jaipur and New Delhi)<sup>16,17</sup> showing lower prevalence of dry eye (18.4% and 29.3% respectively) as compared to studies at high altitude (Leh, India)<sup>18</sup> which showed higher prevalence of dry eye (54%). High altitude is associated with physiological and pathological changes in the eye related to adverse environmental conditions that result in increased tear evaporation and contribute to a higher incidence of dry eye in these regions. The disparity in the percentage of dry eye by age, ranges from 12.5% in the subjects less than 50 years of age to 27.5% in patients more than 65 years of age<sup>1,19</sup>. The various factors, which predispose the older population to dry eye include polypharmacy, hormonal changes, lid laxity, and oxidative stress. Today, with greater life expectancy, a growing number of people are expected to cross 60 years mark, and this could be the reason for the increased

percentage of dry eye in the present study. The previous studies have shown higher percentage of dry eye in females than males<sup>20</sup>, which is also consistent with our results. The higher prevalence of dry eye in females could be contributed by hormonal changes and lacrimal gland dysfunction<sup>21</sup>. The secretory function of lacrimal gland is known to be regulated by androgens<sup>22,23</sup> and females have lower level of androgens compared to males. This could in turn be responsible for more lacrimal gland dysfunction in females and thus gender disparity in the percentage of dry eye.

**Conclusion**

The findings of present study suggest, that the prevalence of dry eye in patients of senile cataract is more common, than has been frequently reported. Although DED is not an absolute contraindication to cataract surgery, the condition should be recognised and investigated, before the final surgical plan and intraocular lens selection. Since cataract surgery has been shown to increase the pre-existing DED, it is important to be vigilant for the DED when evaluating the patients having cataract. Patients with DED must be properly informed of the risks of dry eye associated with cataract surgery –namely visual fluctuations and blur which might cause patient dissatisfaction postoperatively especially those who receive multifocal intraocular lens. These patients should be aggressively treated in the pre and post operative periods even if it means delaying the cataract surgery. This leads to an improved quality and stability of the tear film, giving a more stable ocular surface, allowing for more accurate pre operative measurements, and improved refractive outcomes after cataract surgery.

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