Study of Meibomian Gland Dysfunction in Patients Undergoing Cataract Surgery from Rural Ophthalmology Camps

Anand Murali, Malavika Krishnaswamy
M S Ramaiah Medical College, Bengaluru, Karnataka, India

Summary
This study was performed to determine the prevalence of Meibomian Gland Dysfunction in patients undergoing cataract surgery at rural ophthalmology camps. McMonnies Dry Eye questionnaire was used to evaluate the symptoms. The patients were subjected to slit lamp examination, Schirmer's Test, fluorescein staining and Tear film break-up time (TBUT). After examining 209 patients with varying cataract status, dry eye was found to have a prevalence of 37.8% with TBUT <10 seconds, but only 5.26% showed apparent signs of MGD. 33.5% subjects had a deficient aqueous component. The results suggest that the cause of dry eyes is not attributed to MGD.

Keywords: meibomian gland dysfunction, cataract surgery, dry eye

Introduction
This cross sectional study aims at detecting Meibomian Gland Dysfunction (MGD) pre-operatively, to achieve best visual outcome and patient compliance after cataract surgery. MGD may result in alteration of the tear film. It has been reported that MGD patients undergoing cataract surgery were found to have significant dry eye symptoms and ocular surface disease. They were also at a higher risk of postoperative complications, namely infection and corneal ulcers. Hence, it is important to evaluate for MGD in patients undergoing cataract surgery. MGD is perhaps the most underdiagnosed, and undertreated disease in the eye care world. In a study conducted by Basak PL et al, it was found that MGD had a prevalence of 31.7% in a hospital based population in West Bengal. In a study conducted by Khurana et al, the incidence of dry eye was reported to be higher amongst outdoor workers and people from rural areas with poor socioeconomic status.

Materials and Methods
Patients were included from rural ophthalmology camps conducted by a tertiary care hospital. A total of 209 patients undergoing cataract surgery were selected for the study. McMonnies Dry Eye questionnaire (Figure 1) was used to evaluate the symptoms. [Score key- >20: indicative of dry eye, 10-20: borderline dry eye disease]

1. Slit lamp examination
The eyelid was evaluated for blepharitis and lid margin thickening. The meibomian gland orifices were examined for capping.

2. Schirmer’s Test
It was done to determine the production of aqueous component of the tear film [Score Key- >10mm: Normal, <10mm: Deficient aqueous production]

3. Fluorescein staining
The patient’s cornea was stained with fluorescein to find presence of corneal abrasions and to determine height of the tear film meniscus.

4. Tear break up time (TBUT)
The patient’s eye was evaluated for tear film break up time using fluorescein stain. [Score Key TBU >10 seconds: normal, TBUT < 10 seconds positive].

Eligibility
Inclusion criteria: Patients planned for cataract surgery at the rural ophthalmology camps.
Exclusion criteria:
1. Any systemic diseases or medications that cause dry eye
2. Ocular surgery, trauma, herpes infection in past 3 months
3. Presence of any active ocular inflammation.

Correlation between signs and symptoms of MGD was done as follows:
1. χ² Test of Independence was run between the symptoms (Score based on McMonnies questionnaire) and the signs (1. Schirmer’s test score; 2. TBUT in seconds).
2. Graphs were plotted between the symptoms (Score based on McMonnies questionnaire) and the signs [1. Schirmer’s test score (Figure 2) ; 2. TBUT in seconds (Figure 3)].

| Table 1: Observation and Results |
|-------------------------------|
| Number of Subjects | Symptomatic Subjects | Signs of Dry Eye | Signs of Aqueous Deficiency |
|---------------------|----------------------|------------------|--------------------------|
|                     | Questionnaire score > 10 | TBUT < 10 seconds | Schirmer’s Test < 10 mm |
| 209                 | 82                   | 79               | 70                       |
|                     | 39.20%               | 37.80%           | 33.50%                   |
Discusssion
82 subjects (39.2%) were symptomatic. 79 subjects (37.8%) were found to have a TBUT < 10 seconds, which is suggestive of Dry Eye. 70 subjects (33.5%) had a Schirmer’s test score of <10, which is suggestive of deficient aqueous component of tear which could be an additional cause of dry eye in these subjects. (Table 1)

In a study conducted by Horwath Winter J et al, 30.1% of the MGD patients had Schirmer’s test values equal or below 5mm. It was concluded by the study that tear deficiency was often associated with MGD. Among our patients, 11 (5.26%) showed apparent signs of Meibomian gland involvement like capping. One patient (0.005%) had apparent blepharitis. The obstruction of Meibomian gland ducts was appreciated in negligible number of patients on slit lamp examination. The above results suggest that the cause of dry eyes is not attributed to MGD. It could be attributed to deficient aqueous layer of tear film, the cause of which could probably be dehydration, Vitamin A deficiency or age related atrophy of the lacrimal glands. χ2 Test of Independence revealed statistic of 62.66 between symptoms and Schirmer’s Test (mm) {p=0,<0.05} and statistic of 91.13 between symptoms and TBUT (seconds) {p=0,<0.05}. Hence, there is significant association between symptoms and signs at 95% confidence interval.

Conclusion
This study was performed to determine the prevalence of Meibomian Gland Dysfunction in patients undergoing cataract surgery at rural ophthalmology camps. After examining 209 patients with varying cataract status, dry eye was found to have a prevalence of 37.8% (31.1-44.5) with a TBUT < 10 seconds, but only 5.26% (11 out of 209) showed apparent signs of Meibomian gland involvement. 33.5% subjects (70 out of 209) had a deficient aqueous component. The results suggest that the cause of dry eyes is not attributed to MGD. It could be attributed to deficient aqueous layer of tear, the cause of which could probably be dehydration, or age related. To achieve optimum patient compliance and quality of life post-operatively, screening for dry eye should be made part of the protocol for pre-operative evaluations, especially in patients from rural camps. The correlation obtained by statistical analysis and graphical observation is significant. This study observes that most patients approach hospitals only with reduced vision and ignore the symptoms of dry eye.
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Corresponding author: Anand Murali
M S Ramaiah Medical College, Bengaluru, Karnataka, India
Email id: anand.m95@gmail.com