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To identify Meibomian Gland Dysfunction and it's association with dry eye symptoms in patients undergoing cataract surgery at tertiary care centre

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Abstract

Background: *Cataract surgery is the most frequent surgical procedure in the world.1 Even though excellent postoperative recovery for the majority patients (visual acuity 10/10), dry eye may lead to symptoms of ocular irritation and a change in quality of vision.1The development or aggravation of signs and symptom of dry eye after cataract surgery is multifactorial which can be due to inflammation, loss of goblet cells, lacrimal under secretion, eye drop toxicity and decrease in corneal sensitivity. MGD is the main cause of dry eye syndrome due to over evaporation. Its prevalence varies from 20 to 60%.1 MGD is a chronic, diffuse condition of Meibomian glands, which is characterized by obstruction of the terminal canals and/or changes in the Meibum.*

Objectives: *To identify Meibomian Gland Dysfunction and it's association with dry eye symptoms in patients undergoing cataract surgery.*

Method: *Patients who were admitted in tertiary care centre during study period of 18 months for cataract surgery were included. Patients having systemic diseases or on medications that cause dry eye, undergone any ocular surgery, trauma, herpes infection in past 3 months, having lid abnormality or any active ocular inflammation and paediatric cataract case were excluded. For each patient visual acuity was taken. Complete slit lamp bio-microscopy examination and Funduscopy done.*

All study participants were evaluated for Meibomian gland dysfunction by examining for following findings: Meibomiangl and secretion, Meibomian gland plugging, bulbar conjunctival redness, lid margin redness, lid margin debris and tear film break up test. Schirmer's test was done.

Standardized Patient Evaluation of Eye Dryness (SPEED) Questionnaire was filled for every patient and the score was calculated.

Result: *Out of 261 patients 109 were male and 152 were female. Considering the SPEED score >8 significant for dry eye, total 52 patients were having dry eye and 209 patients were below the range of dry eye. 139 patients were having MGD score <2, 114 patients were having MGD score >2 and 8 patients were having MGD score >8. On schirmer test examination, 2 patients were having <5 mm, 53 patients were having 5-10 mm and 206 patients were having >10 mm. On considering the MGD score and SPEED score, there was statistically significant association between them, with sensitivity of 80.77. Cut of value (1.5) of MGD Score decided using Youden Index, which indicates that sensitivity was 80.8% and specificity was 42.5%.*

It has been observed that the mean age was higher in >8 MGD score group which was statistically significant. And also the mean age was higher in >8 SPEED score group which was statistically significant. Prevalence of MGD increases with age.

Conclusion: *The study shows significant association of MGD and Dry eye in patients undergoing cataract surgery. Dry eye disease and MGD are common diseases and prevalence significantly increases with age. Prophylactic preoperative testing for MGD should be routinely included in preoperative evaluation of Meibomiangl and function of cataract surgery patients.*

Keywords: *Cataract Surgery, Meibomian Gland Dysfunction (MGD), SPEED (Standard Patient Evaluation of Eye Dryness).*

Introduction

Cataract surgery is the most frequent surgical procedure in the world.1 Even though excellent postoperative functional recovery for the majority of patients (visual acuity 10/10), dry eye may lead to symptoms of ocular irritation and a change in quality of vision which is due to tear film instability often (up to 50%).[1] Dry eye syndrome is an ocular surface disease. Two classic mechanisms are described: 1. dryness due to lacrimal under secretion and 2. dryness due to over evaporation, which is primarily associated with Meibomian gland dysfunction. The development or aggravation of signs and symptom of dry eye after cataract surgery is multifactorial which can be due to inflammation, loss of conjunctival goblet cells, lacrimal under secretion, eye drop toxicity and decrease in corneal sensitivity.

Certain patients may complain of ocular and visual discomfort even with an apparently normal ocular surface examination.[1] Meibomian gland dysfunction (MGD) is the main cause of dry eye syndrome due to over evaporation which may also play role in dryness due to under secretion. Its prevalence varies from 20 to 60% according to studies.[1] MGD is a chronic, diffuse condition of the Meibomian glands, which is characterized by obstruction of the terminal canals and/or qualitative or quantitative changes in the Meibum. It may be diagnosed based on complaints associated with eyelid inflammation (blepharitis) or dry eye syndrome, or while systematic examination, and may be completely asymptomatic.[1]

Material and Method

Demographic data of all study participants were recorded. Complete slit lamp bio-microscopy examination was done for anterior and posterior segment. Fundus examination was done with help of 90D lens using Slit lamp Bio-microscope. Patients were explained about the disease and its treatment guidelines and for wish to enroll in the study. Written consent was taken.

All study participants were evaluated for Meibomian gland dysfunction by examining for following findings:

Sr.No.	Title	Score	Finding
1.	Meibomian gland secretion on digital pressure on the central third of the lower eyelid	0	clear secretion
		1	cloudy secretion
		2	turbid clumps secretion
		3	solid paste like secretion
2.	Meibomian gland plugging	0	clear orifice in the central part in the central part of lower lid
		1	less than one third of the orifices contained turbid or oily secretion
		2	between one third and two-thirds of the orifices contained turbid or oilysecretion
		3	more than two-thirds of the orifices contained turbid or oily secretions
3.	Bulbar conjunctival redness	0	None
		1	Pink
		2	Red
		3	Dusky red on slit lamp
4.	Lid margin redness		None
		1	Pink
		2	Red
		3	Dusky red on slit lamp
5.	Lid margin debris	0	Absent
		1	Present
6.	Tear Film Break Up Test	0	>10 sec
		1	8-10 sec
		2	5-7 sec
		3	<5 sec

Total score of 16 taken into account.

Standardized Patient Evaluation of Eye Dryness (SPEED) Questionnaire was filled for every patient and the score was calculated.

Type of symptoms Sr.No.		Dryness, Grittiness, Scratchiness	Irritation	Burning or watering	Eye fatigue
1.Symptoms	At the visit (Yes/No)				
	Within past 72 hours (Yes/No)				
	Within past 3 months (Yes/No)				
2.Frequency	0(Never)				
	1(Sometimes)				
	2(Often)				
	3(Constant)				
3.Severity	0(No problem)				
	1(Tolerable)				
	2(Uncomfortable)				
	3(Bothersome)				
	4(Intolerable)				

4. Do you use eye drops for lubrication? _____YES _____NO If yes how often?_____

TOTAL SPEED SCORE = _____/28

A Score of 8 or higher indicates moderate to severe symptoms.

Study Design

Present study is a cross sectional study conducted over a period of 18 months at a tertiary care Centre. Patients who were admitted in eye ward during study period for cataract surgery were included in study. Patients having systemic diseases or on medications that cause dry eye, undergone any ocular surgery, trauma, herpes infection in past 3 months, having lid abnormality or any active ocular inflammation and paediatric cataract case were excluded.

Statistical Method

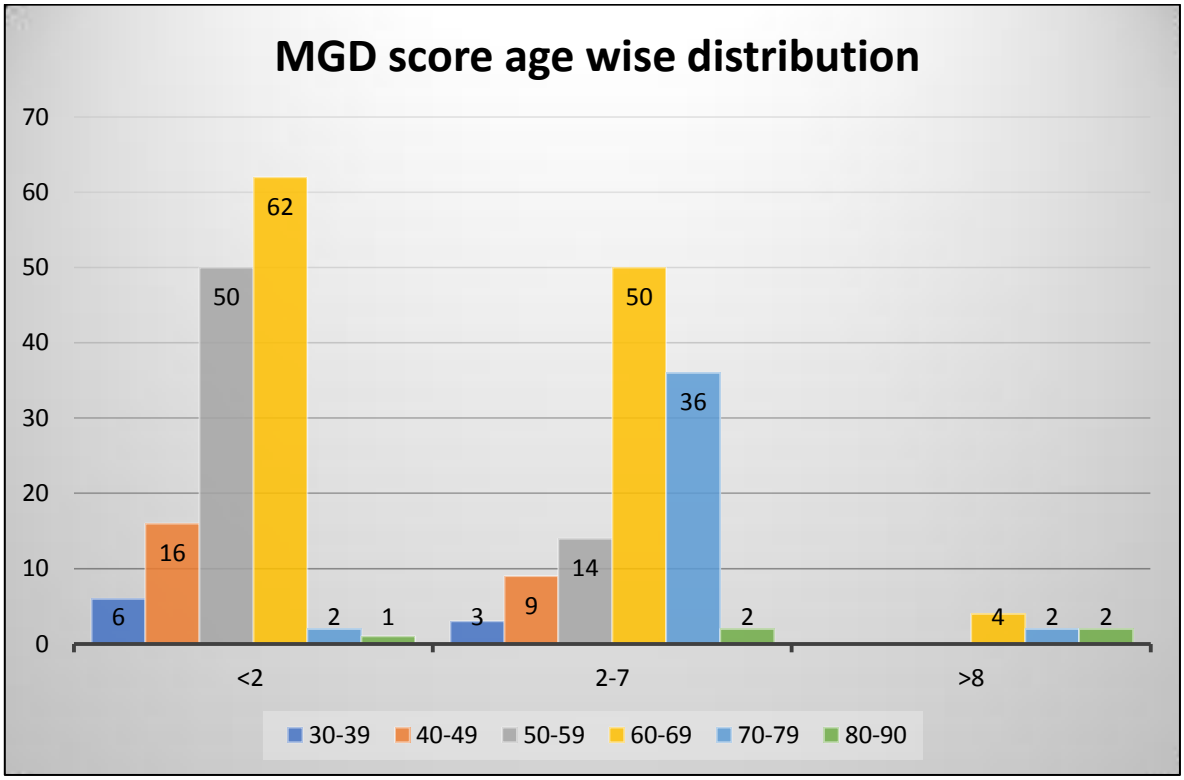
Qualitative data is represented by frequency and percentage whereas quantitative data is summarized by mean and standard deviation. Independent t- test is applied to compare the mean of two independent group at 5% level of significance. ROC (receiving operative curve) is applied to predict the cut off value of MGD Score for dry eyes.

Fig No.1 Meibomian gland dysfunction: expression of opaque meibum

Fig No. 2: Meibomian gland dysfunction: strings of toothpaste-like opaque meibum expressed in response to forceful bimanual gland expression

Results

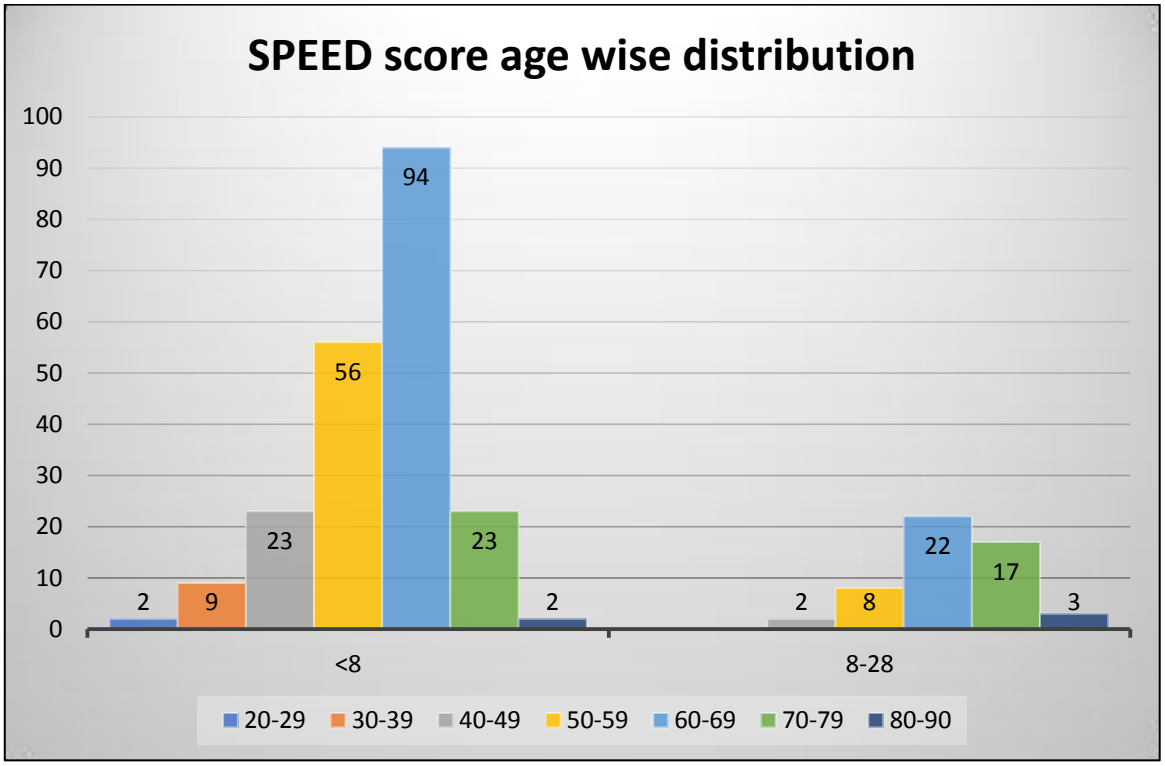
Table I: MGD score age wise distribution



MGD score age wise distribution	20-29	30-39	40-49	50-59	60-69	70-79	80-90	Grand Total
<2	2	6	16	50	62	2	1	139
2-7		3	9	14	50	36	2	114
>8					4	2	2	8
Grand Total	**2**	**9**	**25**	**64**	**116**	**40**	**5**	**261**

Table I shows distribution of patients according to age groups in under those having MGD score <2, 2-7 and >8.

Table II: SPEED score age wise distribution



SPEED score	20-29	30-39	40-49	50-59	60-69	70-79	80-90	Grand Total
<8	2	9	23	56	94	23	2	209
8-28			2	8	22	17	3	52
Grand Total	**2**	**9**	**25**	**64**	**116**	**40**	**5**	**261**

Table II shows age wise distribution of patients under two groups, one having < 8 SPEED score and the other having 8-28.

Discussion

Out of 261 patients examined 109 were male and 152 were female. Considering the SPEED score >8 significant for dry eye, total 52 patients were having dry eye and 209 patients were below the range of dry eye. Out of 261 total no. of patients taken for the study, majority of patients were having age of 60-69 years.139 patients were having MGD score <2, 114 patients were having MGD score >2 and 8 patients were having MGD score >8.On schirmer test examination, 2 patients were having reading of <5 mm, 53 patients were having 5-10 mm and 206 patients were having >10 mm. Mean age for MGD score 2-8 was 58.83 years and for >8 MGD score it was 70.88 years. On considering the MGD score and SPEED score, there was statistically significant association between them, with sensitivity of 80.77% (P value = <0.0001).Cut of value (1.5) of MGD Score decided using Youden Index, which indicates that sensitivity was 80.8% and specificity was 42.5%

In present study, on the comparison of mean age among patients having the MGD score >8 and 2-8, it has been observed that the mean age was higher in >8 MGD score group which was statistically significant (P- value 0.001592). On the comparison of mean age among patients having the SPEED score <8 and >8, it has been observed that the mean age was higher in >8 SPEED score group which was statistically significant (P- value 0.00000233) with a sensitivity of 80.77%. From this values it can be said that prevalence of MGD is remarkable in cataract patients. Prevalence of MGD also increases with age.

Conclusion

The study shows significant association of Meibomian gland dysfunction and Dry eye in patients undergoing cataract surgery. Meibomian gland dysfunction is considerably prevalent in patients presented for cataract surgery. Dry eye disease and Meibomian gland dysfunction are very common diseases and prevalence significantly increases with age. Prophylactic preoperative testing and treatment for MGD should be routinely included in preoperative evaluation of Meibomian gland function of cataract surgery patients.

Abbreviation

SPEED - Standard Patient Evaluation of Eye Dryness

MGD - Meibomian Gland Dysfunction

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