



MEIBOMIAN GLAND DISORDER: STUDY OF PREVALENCE, RISK FACTORS AND ASSOCIATED CONDITION

Ophthalmology

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ABSTRACT

Background: Meibomian gland dysfunction is defined as a chronic diffuse abnormality of the meibomian glands, commonly characterized by terminal duct obstruction and/or qualitative/quantitative changes in glandular secretion which may result in alteration of the tear film. MGD is a common eyelid disorder which has prevalence of 39 to 50%. **Objective:** To find prevalence of MGD and associated risk factors. **Material And Methods:** 200 patients diagnosed with MGD and 200 age and sex matched controls visiting the outdoor of ophthalmology department of PBM hospital, SPMC Bikaner were enrolled for the study. Both male and female patients above 20 years of age presented with symptoms of dry eye were included in the study. Detailed history was taken about nature of work, duration of computer use and systemic history. **Results:** In our study among 200 patients diagnosed with MGD, the prevalence of MGD in age group 20-40 years was 47.6%, 50.5% in age group of 41-60 years and 50% in 61-80 years. Among 200 patients 80 were males and 120 were females. Prevalence of MGD was significantly more common in outdoor occupation (57.03%) in comparison to indoor occupation (42.97%). Correlation between diabetes and MGD was observed to be highly significant. Prevalence of MGD among diabetic patients was found to be 72%. Out of 200 MGD patients 55.5% had total cholesterol >200 mg/dl. **Conclusion:** We have found MGD was more prevalent in female patients and outdoor workers.. Visual display terminal usage was observed to be a highly significant risk factor for MGD. Correlation between contact lens use and MGD was observed to be significant. Prevalence of MGD among diabetic patients and hypercholesterolemia was found to be significantly more in MGD patients.

KEYWORDS

MGD, contact lens, visual display terminal

INTRODUCTION:

The meibomian glands are sebaceous glands which are present in the tarsal plates of the eyelids. Superficial layer of tear film is formed from the lipid produced from the meibomian glands¹. Meibomian glands secretions are essential for the maintenance of ocular surface integrity. The international workshop on meibomian gland dysfunction defined meibomian gland dysfunction as a chronic diffuse abnormality of the meibomian glands, commonly characterized by terminal duct obstruction and/or qualitative/quantitative changes in glandular secretion which may result in alteration of the tear film, symptoms of eye irritation clinically apparent inflammation and ocular surface disease².

MGD is a common eyelid disorder which has prevalence of 39 to 50% in the US population³ and its incidence increases with the age. MGD can be classified in to hyposecretory/ obstructive and hypersecretory/seborrheic. Stasis of meibum promotes the growth of bacteria on the ocular surface and inside the glands. Their action on the meibomian lipids leads to the production of the toxic mediators which leads to subclinical inflammatory reaction with release of inflammatory events inside the glands, conjunctiva, on the lid margin and on the ocular surface. Tear film stability is also affected by the inflammatory mediators.

Meibomian gland secretion in the MGD patients has an increased melting point and altered viscosity⁴. As the age advances the degenerative changes increases at the posterior lid margin. It also affects the orifices of the meibomian glands by orifices narrowing. Hormonal changes with increasing age is associated with increased frequency of changes in lipid composition such as alteration of lipid profiles⁵. Environmental factor like working in hot and dry conditions and air conditioned rooms are more prone to dry eye disease. Many topical and systemic medications are associated with MGD like antiglaucoma drugs, antidepressants, anti histamines and oral contraceptives. Contact lens wearer is also an important risk factor of MGD. The endocrine disorders like diabetes mellitus and thyroid disease cause lacrimal hyposecretion leading to dry eye. As meibomian gland secretion is lipid in nature there is a possible link between systemic lipid level abnormalities and meibomian lipids.

AIMS AND OBJECTIVES:

1. To assess the severity of MGD in the patients attending outpatient department of ophthalmology.
2. To identify the risk factors associated with MGD and correlate them with its severity.

MATERIALS AND METHODS:

200 patients diagnosed with MGD and 200 age and sex matched controls visiting the outdoor of ophthalmology department of PBM hospital, SPMC Bikaner were enrolled for the study. Written informed consent was taken from the patients. Both male and female patients above 20 years of age presented with symptoms of dry eye, burning sensation, redness, foreign body sensation, ocular discomfort, itching, gritty sensation, ocular fatigue, epiphora were included in the study.

Exclusion Criteria:

1. Patients less than 20 years of age.
2. Patients with recent history of any ocular surgery.
3. Patients with alteration of lacrimal drainage system.

The ocular surface disease index (OSDI) questionnaire was used for the assessment of dry eye.

Slit lamp biomicroscopic examination of both the eyes was done which included tear film examination, anterior and posterior lid margin examination, conjunctiva, inferior fornix and meibum quality.

Detailed history was taken about nature of work, duration of computer use and systemic history. History of diabetes noted and total cholesterol was noted. Following parameters were taken as abnormal: Total cholesterol: hypercholesterolemia >200 mg/dl

All the above data was calculated and risk factors associated with the MGD were recorded. Collected data was tabulated and analyzed statistically.

We used chi square test and unpaired t test for inter group comparison. P value <0.05 was considered as statistically significant in our study.

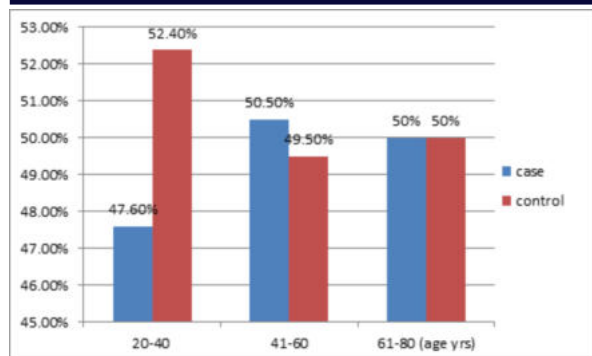
Observation:

The present study was conducted on both eyes of 200 patients diagnosed with MGD and 200 age and sex matched controls visiting the outpatient department of Ophthalmology, PBM Hospital, SPMC Bikaner.

1. Age Wise Distribution:

Table: 1

Age group (yrs)	Case	Control	Total
20-40	40 (47.6%)	44 (52.4%)	84
41-60	90 (50.5%)	88 (49.5%)	178
61-80	70 (50%)	70 (50%)	140
Total	200	200	400



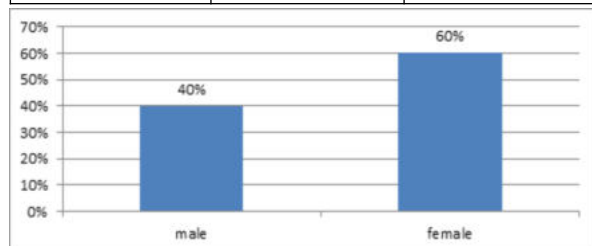
Among 200 patients of MGD the prevalence of MGD in age group 20-40 years was 47.6%, 50.5% in age group 41-60 years and 50% in age group of 61-80 years. We observed that increasing age was not significantly associated with MGD (p value>0.05).

2. Gender Wise Distribution:

Among 200 patients 80 were males and 120 were females. We observed more cases of MGD in female with p value<0.05.

Table 2:

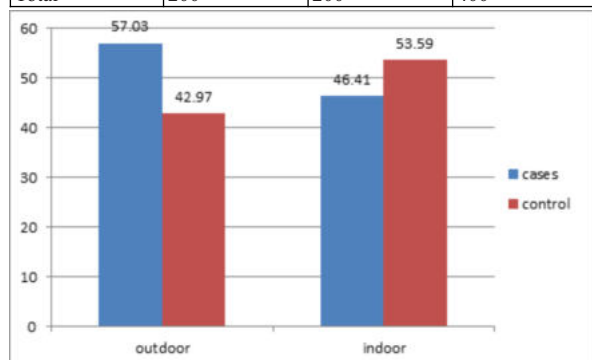
Male	80 (40%)	P value <0.05
Female	120 (60%)	
Total	200	



3. Association Of MGD With Various Occupation:

Table 3:

MGD	Cases	Control	Total
Outdoor work	77 (57.03%)	58 (42.97%)	135
Indoor work	123 (46.41%)	142 (53.59%)	265
Total	200	200	400



Prevalence of MGD was more common in outdoor occupation like farmers, labourers, drivers 57.03% in comparison to indoor occupation 42.97% like students, housewives, teachers, computer workers. The association was found to be statistically significant (p value<0.01).

4. Various Symptoms Of MGD:

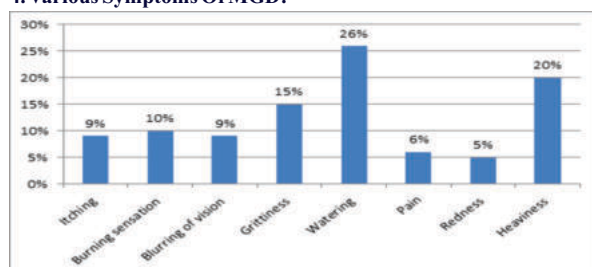


Table 4:

Itching	18 (9%)
Burning sensation	20 (10%)
Blurring of vision	18 (9%)
Grittiness	30 (15%)
Watering	52 (26%)
Pain	12 (6%)
Redness	10 (5%)
Heaviness	40 (20%)

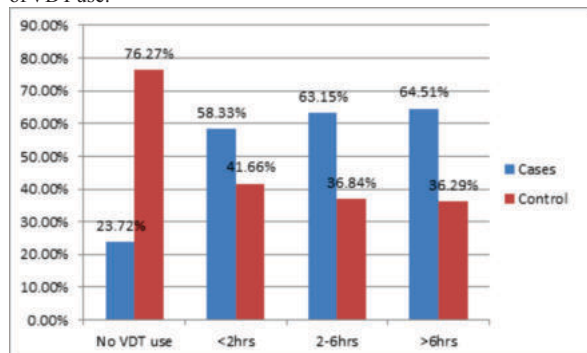
Among the cases of MGD watering is most common symptoms of MGD followed by heaviness and grittiness.

5. Association Of MGD With Visual Display Terminal Use (VDT):

Table 5:

VDT Use(hrs)	Cases	Control	Total
No VDT use	28 (23.72%)	90 (76.27%)	118
<2hrs	42 (58.33%)	30 (41.66%)	72
2-6hrs	60 (63.15%)	35 (36.84%)	95
>6hrs	80 (64.51%)	45 (36.29%)	124
Total	200	200	400

Visual display terminal usage like television, mobile, computer and laptop was observed to be a highly significant risk factor for MGD with p value of<0.001. Prevalence of MGD was associated with VDT use of>6hrs (64.51%), 63.15% in 2-6 hrs followed by 58.33% in <2hrs of VDT use.



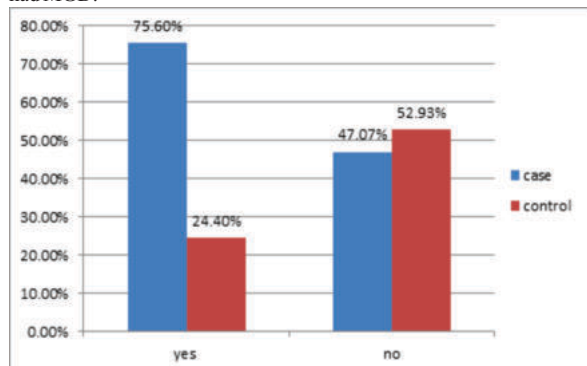
6. Association Of MGD With Contact Lens Usage:

Table 6:

Contact lens usage	Cases	Control	Total
No	169 (47.07%)	190 (52.93%)	359
Yes	31 (75.6%)	10 (24.4%)	41
Total	200	200	400

Pvalue: <0.001

Correlation between contact lens use and MGD was observed to be significant. It was noted that out of 41 contact lens users 31 (75.6%) had MGD.



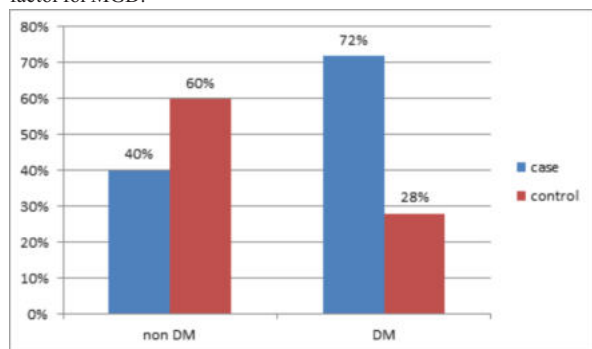
7. Association Of MGD With Diabetes Mellitus:

Table 7:

DM status	Cases	Control	Total
Non -DM	110 (40%)	165 (60%)	275
DM	90 (72%)	35 (28%)	125
Total	200	200	400

Pvalue: <0.001

Correlation between diabetes and MGD was observed to be highly significant with p value <0.001. Prevalence of MGD among diabetic patients was found to be 72%. It shows diabetes to be an important risk factor for MGD.



8. Correlation Of Total Cholesterol With MGD:
Table 8:

Total cholesterol(mg/dl)	
<200	89 (44.5%)
>200	111 (55.5%)
Total	200

Out of 200 MGD patients 55.5% had total cholesterol >200 mg/dl.

DISCUSSION:

MGD is a major cause of dry eye disease. It is common eye lid disorder with wide spread prevalence 39-50% in literature⁵. In our study among 200 patients diagnosed with MGD, the prevalence of MGD in age group 20-40 years was 47.6%, 50.5% in age group of 41-60 years and 50% in 61-80 years. We observed that increasing age was not associated with MGD. This is in consistent with study done by Pinn et al⁶. Brahm P Guliani et al and Villani et al found significant association of increasing age with MGD^{7,8}.

60% of MGD patients were female. Pult et al also observed a significant higher incidence of MGD in female group⁹. Prevalence of MGD was significantly more common in outdoor occupation like farmers, labourers, drivers (57.03%) in comparison to indoor occupation (42.97%) like students, housewives, teachers, computer workers. Study done by Anna Machalinska et al showed no association of MGD with indoor and outdoor occupation¹⁰.

Visual display terminal usage like television, mobile, computer and laptop was observed to be a highly significant risk factor for MGD with p value of <0.001. Prevalence of MGD was associated with VDT use of >6hrs (64.51%), 63.15% in 2-6 hrs followed by 58.33% in <2hrs of VDT use. Our study finding is also supported by the study done in North India where they have found that 89.98% of patients with 4 hrs of VDT usage were associated with severe dry eye¹¹.

Correlation between contact lens use and MGD was observed to be significant. It was noted that out of 41 contact lens users 31 (75.6%) had MGD. It shows use of contact lens is an important risk factor for MGD. R. Arita et al also found that MGD was more common in contact lens users. They found significant higher meibomian gland loss than the age matched non contact lens users¹².

Correlation between diabetes and MGD was observed to be highly significant with p value <0.001. Prevalence of MGD among diabetic patients was found to be 72%. It shows diabetes to be an important risk factor for MGD. Similar finding were noted by Juan Ding et al, they found that diabetes mellitus was important risk factor for MGD¹³.

Out of 200 MGD patients 55.5% had total cholesterol >200 mg/dl. Our study was supported by the study done in 2010 by Dao et al¹⁴, where they found that hypercholesterolemia had higher incidence of MGD as compared to normal population.

CONCLUSION:

We have found MGD was more prevalent in female patients. Prevalence of MGD was significantly more common in outdoor occupation like farmers, labourers, drivers in comparison to indoor occupation like students, housewives, teachers, computer workers. Visual display terminal usage was observed to be a highly significant

risk factor for MGD. Correlation between contact lens use and MGD was observed to be significant. Correlation between diabetes and MGD was observed to be highly significant. Prevalence of MGD among hypercholesterolemia was found to be significantly more in MGD patients.

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