Profile of Meibomian Gland Dysfunction at a Tertiary Centre in Nepal.

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ABSTRACT

Introduction: To study the profile of Meibomian Gland Dysfunction in a tertiary centre in Nepal.

Materials and Methods: A cross-sectional, hospital-based study on 100 cases with MGD from the age group 18-60 years was done for 1 year between January 2018 - January 2019 at B. P. Koirala Lions Centre for Ophthalmic Studies, Institute of Medicine, Maharajgunj Medical Campus, Tribhuwan University. Demographic profiles and clinical grading of MGD were assessed and statistically analyzed.

Results: 100 cases were included in the study. Male to female ratio was about 2:3. The most common age group involved was 21-30 years which accounts for 32% of the cases. Majority of the cases had mild degree of severity comprising 66% of the cases.

Conclusion: This study brings out the clinical profile of Meibomian Gland Dysfunction in a tertiary care hospital in Nepal.

Keywords: Clinical Profile; Dry Eye;Meibomian Gland Dysfunction

INTRODUCTION

Meibomian glands are holocrine, tubulo-acinar structures located in the tarsal plates of the eyelids and open just anterior to the mucocutaneous junction.[1] They secrete meibum, a substance composed of lipids that forms the anterior layer of the tear film which inhibits evaporation of the underlying aqueous layer, and prevents development of dry eye.[1]

Meibomian Gland Dysfunction (MGD) is a common chronic condition of the eyelid in which the normal secretory functions of the meibomian glands are compromised. According to the International Workshop Group's definition, "Meibomian gland dysfunction (MGD) is a chronic, diffuse abnormality of the meibomian glands, characterized by terminal duct obstruction and/or qualitative/quantitative changes in the glandular secretion which may result in alteration of the tear film, symptoms of eye irritation, clinically apparent inflammation, and ocular surface disease."[2]

MGD is thought to be the leading cause of dry eye disease.[3] It is most often caused by obstruction of the meibomian glands secondary to hyperkeratinization of the duct epithelium and plugging with a solidified secretion. This leads to alterations in the tear film lipid layer with increased evaporation and altered tear osmolarity, resulting in dry eye signs and symptoms.[4]49.9 ± 21 × 10-7 g/cm2/second, or 0.49 ± 0.29 µl/minute evaporative loss per eye, and 59.1 ± 28 × 10-7 g/cm2/second, or 0.58 ± 0.23 µl/minute, respectivelyMGD is one of

the most common causes of contact lens intolerance as well.[5]minimal or transient symptoms suggestive of ocular dryness, fluorescein staining of the cornea (often detected only after delayed observation or sequential instillation of stain

Current treatment modalities include warm compression and artificial tears. Severe cases benefit from the use of topical anti-inflammatory agents as well as oral tetracycline derivatives.[3]Recent studies have also shown omega-3 fatty acid supplementation to be beneficial in the treatment of MGD.[6]

Although MGD is a very common disease entity, there has been very little research done on MGD in Nepal. So far to our knowledge, there has been no study of the clinical profile of MGD in the Nepalese population. This will be the first study of the clinical profile of MGD in Nepal and thus, help in describing the disease in the context of Nepal.

MATERIALS AND METHODS

This hospital-based, observational, cross-sectional, non-interventional, descriptive studyrecruited 100 cases of MGD attending General OPD, and EOD and Cornea Clinic of B. P. Koirala Lions Centre for Ophthalmic Studies, IOM, MMC, TU, Kathmandu between January 2018 and January 2019 for a period of 12 months.

Patients were selected based on convenience sampling and diagnosis of MGD was done by ophthalmic examination using Carl Zeiss slit lamp biomicroscope. The eyelid margins, meibomian gland orifices, and meibomian gland secretions were examined for the signs of MGD and graded based on glandular obstruction and quality of meibum expressed. Meibum was expressed by firm digital pressure over the central third of the upper and lower eyelid, while observing the ease of excretion and quality of the meibum under a slit-lamp biomicroscope.

MGD grading was as follows:[28]

Obstruction –

- 0 - no obstruction, meibum easily expressed
- 1 - mild obstruction, meibum expressible with mild pressure
- 2 - moderate obstruction, meibum expressible with moderate pressure
- 3 - complete obstruction, no glands expressible even with hard pressure

Quality of secretion –

- 0 - clear fluid
- 1 - cloudy fluid
- 2 - cloudy particulate fluid
- 3 - toothpaste-like

Based on this examination patients were diagnosed as:

1. Mild MGD – Obstruction grading 1 or Quality of secretion grading 1
2. Moderate MGD – Obstruction grading 2 or Quality of secretion grading 2
3. Severe MGD – Obstruction grading 3 or Quality of secretion grading 3

The exclusion criteria were as follows:

- Patients of age <18 or >60 years.
- Patients with infectious keratoconjunctivitis or inflammatory ocular surface diseases unrelated to MGD.
- History of dyslipidemia or intake of lipid-lowering drugs.
- Patients who underwent recent ocular surgery.
- Patients with alterations of lacrimal drainage system.
- Patients who had topical ophthalmic steroids taken during 4 weeks before the study.

The data were collected from the standard proforma which included demographics, age and sex, patient history and grade of meibomian gland dysfunction. Data was analyzed using SPSS version 21.0 software.

RESULTS

Out of 100 cases, the majority of participants were from the age group 21-30 years which accounts for 32% of the cases followed by the 51-60 years and 41-50 years with 24% and 22% of the cases, respectively. Thus, no significant difference was seen in the number of cases among various age groups.

In terms of sex, 63 of the cases were female whereas

37 of the cases were male which shows a female preponderance which however wasn't statistically significant (p-value: 0.532). Also, all age groups also showed a higher prevalence in females compared to males which suggests a higher likelihood of MGD in females than males.

Table 1 - Age and sex distribution of MGD cases

Age group (years)	No. of cases (n)	Males (%)	Females (%)
18-20	3	1 (33.3%)	2 (66.7%)
21-30	32	12 (37.5%)	20 (62.5%)
31-40	19	8 (42.1%)	11 (57.9%)
41-50	22	8 (36.4%)	14 (63.6%)
51-60	24	8 (33.3%)	16 (66.7%)

Distribution of patients according to Grading of MGD

Majority of the cases had mild degree of severity comprising 66% of the cases, 31% of the cases had Moderate MGD whereas only 3% of the cases had Severe MGD. Thus, the commonest grade of MGD seen in our study was Mild MGD followed by Moderate MGD and then Severe MGD.

Table 2 - Distribution of MGD cases according to Grading of MGD.

Grading of MGD	Frequency	Percentage
Mild	66	66%
Moderate	31	31%
Severe	3	3%
Total	100	100%

DISCUSSION

Meibomian gland dysfunction is a common chronic condition, affecting millions worldwide, and is the commonest cause of dry eye disease.[3]It is a chronic, diffuse abnormality of the meibomian glands, characterized by terminal duct obstruction and/or qualitative/quantitative changes in the glandular secretion which may result in alteration of the tear film, symptoms of eye irritation, clinically apparent inflammation, and ocular surface disease.[2]Recent literature reports wide variations in the prevalence of MGD, with published rates ranging from as low as 3.5% to close to 70% in clinical and population-based studies.[7]

Although MGD rarely threatens sight, it is a troublesome and symptomatic condition. The pathogenetic mechanisms responsible for MGD are not fully understood, but it is most often caused by an altered composition of meibum or an obstruction of the meibomian glands secondary to hyperkeratinization of the duct epithelium and plugging with a solidified secretion.[8,9] These changes lead to alterations in the tear film lipid layer with increased evaporation and tear osmolarity, resulting in dry eye signs and symptoms.[10,4] Long-term treatment is aimed at controlling symptoms through eyelid hygiene.[8,11] Systemic antibiotics and topical antibiotic/steroid combinations are used in the short term in patients with a significant amount of inflammation.[12] Omega-3 and omega-6 fatty acid supplementation has been found to be beneficial in the treatment of MGD.

This study was carried out at B. P. Koirala Lions Centre for Ophthalmic Studies (BPKLCOS), a tertiary eye care centre in Kathmandu, over a period of 12 months. The purpose of the research was to study the clinical profile of MGD in the Nepalese population.

In this study, a total of 100 patients were included with an age range of 18 to 60 years. The study showed that the age group 21-30 years had themost number of patients i.e. 32%, closely followed by 51-60 years and 41-50 years with 24 and 22 patients, respectively. Thus, there was no major difference in the number of cases among different age groups. Some studies have shown a higher prevalence of MGD with advancing age.[7,8] A study done by Kumar et al[13] showed that the majority of the cases were in the age group of 41-70 years of age (59 %) which was significantly higher compared to 34.21% of cases in the age group of 20-40 yrs. Another study done by Hom et al[14] also showed a positive correlation between advancing age and MGD. Our study showed no significant difference in the prevalence of MGD in different age groups. However, except for the 21-30 age group, a steady rise in the number of cases is seen with the advancing age group and the 18-20 age group also had the least number of cases.

In terms of sex, 63% of the cases were female whereas only 37% of the cases were male pointing towards

a female preponderance. Our study is comparable to a study done by Krishnamoorthy et al15 which showed that 46.7% of the females and 20% of the males showed presence of MGD. Another study done by Finis et al16 also had similar results to ours showing a higher prevalence in females. Moreover, all age groups also showed higher prevalence of MGD in females than males in our study.

Regarding severity, the majority of the cases were mild MGD comprising 66% of the cases. There were 31% of moderate MGD cases and only 3% of the cases were of severe MGD. A study done by Jacob et al also showed comparable results with 87.5% of moderate MGD.17

CONCLUSION

This observational, hospital-based, cross-sectional was carried out at B. P. Koirala Lions Centre for Ophthalmic Studies (BPKLCOS), Institute of Medicine (IOM), Maharajgunj Medical Campus (MMC), Tribhuvan University (TU) over a period of 12 months. The purpose of the study was to describe the clinical profile of Meibomian Gland Dysfunction in the context of Nepal.

In our study, 100 cases of MGD were included with an age range of 18 to 60 years. The results of our study showed that females were more prone to get MGD than males, and mild MGD was the commonest form of MGD. Likewise, there was no significant association of MGD with age in our study.

However, a small sample size and the fact that the study was done in only one centre limits the impact of our study. Likewise, data regarding symptoms weren't collected in our study as diagnosis was based on slit lamp examination rather than patient's complaints, which is also a limiting factor of our study.Thus, we recommend a larger community-based, multi-centric study including patient's symptomatic findings which can more accurately describe the profile of MGD in Nepal.

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