Original Article

Evaluating The Self-Reported Symptoms Associated With Dry Eyes: A Survey Study

Dr. Anand V Deshpande[1], Dr Suyash Noel Ranga[2], Dr. Mary Jenifa Tigga[3], Dr. Tarun Vashisth[4*], Dr. Richa Khandelwal[5]

[1]MBBS, MS, Associate Professor, Department of Ophthalmology, Sri Shankaracharya Institute of Medical sciences, Bhilai, Durg, Chhattisgarh
[2]MBBS, MS, Assistant Professor, Department of Ophthalmology, Sri Shankaracharya Institute of Medical sciences, Bhilai, Durg, Chhattisgarh
[3]MBBS, MS, Assistant Professor, Department of Ophthalmology, Sri Shankaracharya Institute of Medical Sciences, Bhilai, Durg, Chhattisgarh
[4*]MBBS, PG Student, Department of Ophthalmology, Sri Shankaracharya Institute of Medical sciences, Bhilai, Durg, Chhattisgarh
[5]MBBS, PG Student, Department of Ophthalmology, Sri Shankaracharya Institute of Medical sciences, Bhilai, Durg, Chhattisgarh

*Corresponding Author: Dr. Tarun Vashisth

*MBBS, PG Student, Department of Ophthalmology, Sri Shankaracharya Institute of Medical sciences, Bhilai, Durg, Chhattisgarh, Email id: tarunvashisth86@gmail.com
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Abstract

Background: With the raised criticality of the COVID-19 pandemic, the use of face masks was widespread as a protective measure against the spread of the COVID-19 pandemic. The subjects using masks regularly reported the symptoms of dry eyes. However, the literature doesn't describe the prevalence of dry eyes clearly.

Aim: The present study aimed to assess the self-reported symptoms associated with dry eyes and masks in the general Indian population and to assess factors affecting the condition.

Methods: The study assessed 521 subjects that were assessed for dry eye symptoms using the survey that was given to the subjects in both English and Hindi format. The data gathered was analyzed statistically to form the results.

Results: Among 521 subjects assessed, 93.85% (n=489) subjects had the symptoms of dry eyes, and the symptoms were exacerbated in 26.78% (n=131) subjects by wearing face masks. Hence, 18% of study subjects had dry eyes associated with mask-wearing. No significant association was seen between mask-associated dry eyes and pre-existing ocular discomfort, refractive correction, and age. A positive association was seen between retail work and the female gender to dry eyes.

Conclusion: It was concluded that most subjects reported no change in ocular symptoms after wearing the face mask. However, a significant increase in ocular discomfort was seen after wearing the face mask. Eye care professionals should assess clinical signs in subjects reporting mask-induced eye discomfort and suggest appropriate measures to treat these conditions.

Keywords: Dry eyes, ocular discomfort, mask-associated dry eyes, kera to conjunctivitis

INTRODUCTION

As COVID-19 caused by novel SARS-Cov-2 affected a large population globally and caused a very high mortality rate worldwide. As a preventive measure to prevent its spread and limit the associated mortality rate, it was recommended to wear face masks at all times including visits to outdoor places.[1] However, some concerns were being raised and it was considered highly inconvenient and uncomfortable by many individuals. Also, a majority of the population has reported various complaints associated with the use of face masks including complaints of fogged glasses, sweating, skin irritation, difficulty in breathing, and/or headache limiting the use of face masks by the majority of the subjects.[2]

MADE or mask-associated dry eyes was the first anecdotal observation which was first observed in June 2020 by D.E White, an American Ophthalmologist who first described this condition on his blog, and also introduced the term MADE for mask-associated dry eyes. Recent literature data described that the symptoms of dry eyes are higher in subjects using face masks. However, no literature data work depicted the prevalence of the symptoms of dry eyes.[3]
The present clinical observational, descriptive survey study was aimed to evaluate the self-reported symptoms of mask-associated dry eyes in the general Indian population and to assess the factors affecting this condition including use of various refractive corrections (contact lenses or glasses), occupation, gender, and age.

MATERIALS AND METHODS

The present clinical observational, descriptive survey study was aimed to evaluate the self-reported symptoms of mask-associated dry eyes in the general Indian population and to assess the factors affecting this condition including use of various refractive corrections (contact lenses or glasses), occupation, gender, and age. The study was done at the Department of Ophthalmology, Sri Shankaracharya Institute of Medical sciences, Bhilai, Durg, Chhattisgarh after the required clearance was given from the Institutional Ethical Committee.

For the present study, a survey was used as a tool made in both Hindi and English language. The participating subjects were asked to fill out the survey form on the spot and submit it back to the study investigator. The survey considered the demographic data of the participants including the frequency of dry eye symptoms such as burning, itching, irritation, dryness, and foreign body sensation along with the profession, gender, and age of the study subjects.

For the frequency of the dry eye symptoms, subjects were asked to mark often, sometimes, or never as their choice. The study did not utilize the preformed structured questionnaire, however, the study used minimum questions, and symptoms were categorized as one single question. In subjects reporting no symptoms, subjects were asked to answer the survey questions further. The subjects reporting the symptoms of dry eyes were further asked if their symptoms stayed the same, worsen, or were better during the phase of face mask-wearing. The subjects were also asked if they wear contact lenses or glasses.

The MASK (mask-associated dry eyes) for the present study was defined as a condition where the symptoms of dry eyes were seen for a minimum of some time and worsen with the use of the face mask. Following this definition, the subjects taken affected by MADE were subjects whose symptoms of dry eyes worsen on wearing the face masks and the subjects that reported the appearance of the symptoms only on wearing the face masks. The study subjects where no symptoms of dry eyes were reported and subjects, where dry eyes symptoms were reported and did not worsen by wearing the face masks, were considered unaffected by MADE.

The data gathered was subjected to statistical analysis using the SPSS software version 21.0 along with Odd's ratio and 95% CI (confidence interval). The significance level was kept at a p-value of <0.05.

RESULTS

The present clinical observational, descriptive survey study was aimed to evaluate the self-reported symptoms of mask-associated dry eyes in the general Indian population and to assess the factors affecting this condition including use of various refractive corrections (contact lenses or glasses), occupation, gender, and age. The study assessed 521 subjects from both genders 35.31% (n=184) males and 64.68% (n=337) female subjects. The study assessed subjects within the age range of 40 years to 80 years and a mean age of 46.4±2.88 years. The demographic data of the study participants are described in Table 1. In the present study, no association was seen between dry eye symptoms and the age of the study subjects. Also, no correlation was seen on symptom worsening after wearing the face mask with OR-1.00 and p=0.16. The symptoms of ocular irritation were more prevalent in female subjects along with more worsening of dry eye symptoms with OR of 1.56 and 1.46 respectively and the respective p-values of <0.05.

On assessing the change in symptoms of ocular discomfort on wearing the face mask, no ocular discomfort was seen in 32.05% (n=167) study subjects, no change in the ocular discomfort symptom was seen in 48.94% (n=255) study subjects, the symptoms got better in 0.95% (n=5) study subjects, and the symptoms got worsen after wearing a face mask in 18.04% (n=94) study subjects respectively as shown in Table 2. It was seen that subjects that often reported ocular discomfort were more likely to have worsened the ocular discomfort on wearing the face mask in comparison to subjects who reported symptoms only sometimes with OR of 1.26 and $p<0.05$.

The study results showed that no correction measures were used by 29.98% (n=151) study subjects, contact lenses were used by 10.94% (n=57) study subjects, and the glasses were worn by 60.07% (n=313) study subjects respectively as depicted in Table 3. The study results showed no statistically significant difference in symptoms of ocular discomfort between subjects wearing contact lenses or glasses with OR of 1.22 and p=0.27, whereas, less frequency of symptoms was reported in subjects needing no correction with $p<0.05$. However, no significant difference was seen in symptoms worsening in subjects wearing contact lenses or glasses with OR=1.06 and p=0.26, whereas, subjects needing no correction reported MADE with less frequency with OR=0.83 and $p<0.05$.

Concerning the occupation of the study subjects, no statistically significant difference was seen in dry eyes symptom prevalence, however, a statistically significant difference was seen in the worsening of dry eyes symptoms on face mask users with most reported MADE in retailers with OR=1.55 and $p<0.05$ and the housewives with OR and p as 1.06 and <0.05 respectively. For other professions, no statistically significant association was seen in studied symptoms and retires, students, factory workers, office workers, healthcare professionals, and teachers.

On logistic regression analysis, no significant association was seen of pre-existing ocular discomfort, refractive correction, and age to the self-reported MADE. However, MADE showed a negative association with the male gender having an Odds ratio of 0.67, and a positive association was seen with the retailer profession having an OR of 2.12 and $p<0.001$.

DISCUSSION

The present study assessed 521 subjects from both genders having 35.31% (n=184) males and 64.68% (n=337) female subjects. The study assessed subjects within the age range of 40 years to 80 years and a mean age of 46.4±2.88 years. In

the present study, no association was seen between dry eye symptoms and the age of the study subjects. Also, no correlation was seen on symptom worsening after wearing the face mask with OR-1.00 and p=0.16. The symptoms of ocular irritation were more prevalent in female subjects along with more worsening of dry eye symptoms with OR of 1.56 and 1.46 respectively and the respective p-values of <0.05. These data were compared to the studies of Scheid JL et al[4] in 2020 and Matusiak L et al[5] in 2020 where authors assessed subjects with demographic data comparable to the present study.

The study results showed that the change in symptoms of ocular discomfort on wearing the face mask, no ocular discomfort was seen in 32.05% (n=167) study subjects, no change in the ocular discomfort symptom was seen in 48.94% (n=255) study subjects, the symptoms got better in 0.95% (n=5) study subjects, and the symptoms got worsen after wearing a face mask in 18.04% (n=94) study subjects respectively. It was seen that subjects that often reported ocular discomfort were more likely to have worsened the ocular discomfort on wearing the face mask in comparison to subjects who reported symptoms only sometimes with OR of 1.26 and p<0.05. These results were consistent with the studies of Roberge RJ et al[6] in 2012 and Jones LW[7] in 2020 where authors suggested similar changes in the symptoms after wearing face masks as in the present study.

It was reported that no correction measures were used by 29.98% (n=151) study subjects, contact lenses were used by 10.94% (n=57) study subjects, and the glasses were worn by 60.07% (n=313) study subjects respectively. The study results showed no statistically significant difference in symptoms of ocular discomfort between subjects wearing contact lenses or glasses with OR of 1.22 and p=0.27, whereas, less frequency of symptoms was reported in subjects needing no correction with p<0.05. However, no significant difference was seen in symptoms worsening in subjects wearing contact lenses or glasses with OR=1.06 and p=0.26, whereas, subjects needing no correction reported MADE with less frequency with OR=0.83 and p<0.05. These results were in agreement with the studies of Stapleton F et al[8] in 2017 and Chalmers RL[9] in 2005 where symptoms of ocular discomfort had a similar correlation between corrective measure wearing and symptoms.

For the occupation of the study subjects, no statistically significant difference was seen in dry eyes symptom prevalence, however, a statistically significant difference was seen in the worsening of dry eyes symptoms on face mask users with most reported MADE in retailers with OR=1.55 and p<0.05 and the housewives with OR and p as 1.06 and <0.05 respectively. For other professions, no statistically significant association was seen in studied symptoms and retires, students, factory workers, office workers, healthcare professionals, and teachers. These results were in line with the findings of Simpsons TL[10] in 2008 and Moshirfar M[11] in 2020 where a similar association was seen between dry eyes and the profession of the study subjects.

On logistic regression analysis, no significant association was seen of pre-existing ocular discomfort, refractive correction, and age to the self-reported MADE. However, MADE showed a negative association with the male gender having an Odds ratio of 0.67, and a positive association was seen with the retailer profession having an OR of 2.12 and p<0.001. These results were similar to the studies of Wu P et al[12] in 2020 and Hong N et al[13] in 2020 where the authors suggested a similar association of pre-existing ocular discomfort, refractive correction, and age to the self-reported MADE as in the present study.

CONCLUSION

Considering its limitations, the present study concludes that most subjects reported no change in ocular symptoms after wearing the face mask. However, a significant increase in ocular discomfort was seen after wearing the face mask. Eye care professionals should assess clinical signs in subjects reporting mask-induced eye discomfort and suggest appropriate measures to treat these conditions.

Conflict of Interest: None

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TABLES

Characteristics	Percentage (%)	Number (n=521)
Mean age (years)	46.4±2.88	
Age range (years)	40-80	
Gender		
Males	35.31	184
Females	64.68	337

Table 1: Demographic characteristics of the study subjects

Change in ocular discomfort on wearing a face mask	Percentage (%)	Number (n=521)
No symptom	32.05	167
Same symptoms	48.94	255
Better	0.95	5
Worsen	18.04	94

Table 2: Change in ocular discomfort symptoms after wearing the face mask

Corrective measures	Percentage (%)	Number (n)
No correction	28.98	151
Contact lenses	10.94	57
Glasses	60.07	313

Table 3: Use of different corrective measures by the study subjects