

## OCULAR SURFACE PROBLEMS AMONG SMOKERS AND NON-SMOKERS

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### ABSTRACT

**PURPOSE:** To assess the ocular surface problems in smokers and non-smokers.

**METHOD:** A descriptive cross-sectional survey including 224 participants above 18 years of age was conducted at College of Ophthalmology & Allied Vision Sciences from September to December 2020. Participants were divided into two groups, smokers and non-smokers. Data was collected online by self-designed questionnaire related to ocular surface issues.

**RESULTS:** Total 224 participants, above 18 years of age including 112 smokers and 112 non-smokers. Most smokers were having problems in their eyes. 60.71% smokers and 26.7% non-smokers experienced redness in eyes. 53.57% smokers and 26.78% non-smokers had dryness in eyes. 26.78% smokers and 20.53% non-smokers got puffy eyes. 87.5% smokers and 33.92% non-smokers felt like having something in eyes. 53.57% smokers and 26.78% smokers had visual fatigued. 74.10% smokers and 33.92% non-smokers reported temporary blurriness in eyes. 40.17% smokers and 20.53% non-smokers sometimes got distorted vision. 47.32% smokers and 26% non-smokers had sensitivity to strong lights. 60.71% smokers and 13.39% non-smokers had difficulty whiling moving around or driving at night. 66.96% smokers and 20.53% non-smokers experienced accumulation white mucus around eyes. 47.32% smokers and 40.17% non-smokers blinked 12-18 times per minute. Data was entered and analyzed by utilizing SPSS.

**CONCLUSION:** Most smokers were having problems in their eyes. As compared to non-smokers they experienced more redness, dryness of eyes, puffy eyes, temporary blurriness, and fatigued eyes. Smokers had difficulty while driving at night, distorted vision while examining objects in their external environment.

**KEY WORDS:** ocular, surface disorder, dry eye syndrome, allergic, smoke

### INTRODUCTION

The cornea, conjunctiva, eyelids, and lacrimal glands collectively make the ocular surface. Any disorder in these structures is termed as ocular surface disorder (OSD). The occurrence rate of dry eye disease is most common among all the ocular surface diseases. It happens frequently that many cases of such disease go undiagnosed due to wrong assessment or not understanding the symptoms appropriately. With the growing age, these disorders become more common and get worse. Conditions include in OSD are meibomian gland dysfunction (MDG), blepharitis, dry eye diseases and allergic eye diseases (AED), chemical and thermal burns etc. OSDs can

genuinely influence the vision.<sup>1-3</sup>

Dry eye disorder (DED) is known to be the most conventionally ophthalmic clinical issues, causing burning, itching, or even dryness. The management includes tear substitutes, which give little side effect to help to a brief period. However, they require a regular application. Smoking is known as one of the variables in a considerable number of symptoms that effect tear film, bringing about dry eye. In our examination, precorneal tear film and ocular surface is also critically affecting by smoking and, there are numerous hypotheses about how smoking triggers the precorneal tear film to break. The most probable reason for tear film

breakage prompting dry eye side effects is lipid peroxidation of the external layer of the precorneal tear film.<sup>4-6</sup>

Smoking has many complications for the eyes as the toxins present in it decreased blood flow by making clots in the eyes' capillaries and blocking the path of vital nutrients for ocular health. Epidemiological data obtained in the Keio University School of Medicine, Japan interface smoking as a danger element for numerous ocular disorders, including ocular sarcoidosis, POAG, conjunctival intraepithelial neoplasia, diabetic retinopathy, thyroid ophthalmopathy, ARMD, anterior ischemic optic neuropathy, strabismus in the offspring of pregnant smokers, cataracts, and development of dry eyes.<sup>7,8</sup>

Dryness of eyes leads to symptoms of distress, visual distortion and variability of tear film with prospective harm to the ocular surface. Smoke of tobacco is one of the irritants to eyes; worsens the dry eyes.<sup>9</sup>

Several eye diseases are linked with smoking including age related macular degeneration, cataract, tobacco- alcohol amblyopia, thyroid ophthalmopathy and many others.<sup>10</sup> in literature, there have been studies reported effects of smoking cigarettes on tear film of the eyes. Among smokers it had been reported that there is reduced sensitivities of cornea and conjunctiva, metaplasia of conjunctival squamous change in tear proteins, and decreased concentration of goblet cells.<sup>11</sup>

It is summed up from an investigation that these findings recommend that eye care experts talk about and offer smoking discontinuance choices as a component of the administration of patients with eye infections, particularly those with eye irritation, AMD, and focal point opacities/waterfalls and thyroid related orbitopathy. Wellbeing efforts utilizing existing

clinical information can improve public familiarity with the association among tobacco and visual debilitation.<sup>12, 13</sup> From many studies, it was found that people knew and were afraid of going blind and vision loss, linked with smoking.<sup>14</sup>

Tobacco executes more than 5,000,000 lives every year and is answerable for 1 out of 10 adult deaths. Tobacco use is assessed to execute over 8 million individuals for each year by 2030. Despite the fact that lungs cancer is emphatically related to smoking, tobacco use additionally expands the danger of cardio diseases and other vascular diseases.<sup>15</sup>

Directness to cigarette smoke (CS) pollution has recently been related to dry eye manifestations. In vivo clinical assessments, including corneal fluorescein staining, tear film breakdown time, and tiny confocal perceptions were performed when openness. Likewise, corneal and conjunctival epithelial harm happened, corneal ultrastructure changed, and cup cell thickness diminished. The outcomes demonstrated that CS is harmful to the visual surface.<sup>16, 17</sup>

At long last, the unfavorable impacts of smoking on eye infection have been progressively recorded in non-white populaces outside the U.S. Be that as it may, regardless of a bounty of information, public attention to the unfriendly results of smoking on the vision lacks in the U.S. Australia improved general advertency by dispatching a fruitful enemy of tobacco wellbeing effort featuring the impacts of smoking on eye wellbeing.<sup>18, 19</sup>

Since visual deficiency is so dreaded, the message links blindness and smoking can create a reaction. There are numerous approaches to convey this report tips, and all are adequate as long as the message is clear quit smoking.<sup>20</sup>

## MATERIALS AND METHODS

It was a descriptive Cross-sectional study and held in College of Ophthalmology and Allied Vision Sciences, King Edward Medical University/Mayo Hospital Lahore from September to December 2020. Inclusion criteria were smokers and nonsmokers above 18 years of age. Exclusion criteria were patients with contact focal points, eye sicknesses, including meibomian gland dysfunction, blepharitis, irresistible keratoconjunctivitis, and any systematic disease with the visual surface illness. Quantitative variables were presented in the form of mean. Qualitative variables were presented as frequency and percentage. Qualitative data were measured by applying the Chi-square test and quantitative data were measured by taking mean standard deviation ( $\pm$ SD). Data was entered and analyzed by SPSS software.

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## RESULTS

60.71% smokers and 26.7% non-smokers experienced redness in eyes. 53.57% smokers and 26.78% non-smokers had dryness in eyes. 26.78% smokers and 20.53% non-smokers got puffy eyes. 87.5% smokers and 33.92% non-smokers felt like having something in eyes 20.5% smokers and non-smokers had watery eyes. 53.57% smokers and 26.78% smokers had visual fatigued. 74.10% smokers and 33.92% non-smokers reported temporary blurriness in eyes. 40.17% smokers and 20.53% non-smokers sometimes got distorted vision. 47.32% smokers and 26% non-smokers had sensitivity to strong lights. 60.71% smokers and 13.39% non-smokers had difficulty whiling moving around or driving at night. 66.96% smokers and 20.53% non-smokers experienced accumulation white mucus around

eyes. 47.32% smokers and 40.17% non-smokers blinked 12-18 times per minute (Table 1). Tear strength of smokers was decreased, punctate staining of cornea was increased in smokers and the susceptibility of the cornea and conjunctiva was reduced in smokers. Individuals have average screen time per day smokers. In addition, 1, 7, 4 and 3 individuals among nonsmokers have less than 3 hours, 3-6 hours, 6-9 hours and more than 9 hours per day respectively (Table 2). 23.33 % smokers and 26.67% non-smokers had examined their eyes by medical professional more than one year ago.

## DISCUSSION

In a study conducted in India, it had been concluded that smoking has deteriorating effects on the surface of the eye. Contracting with smoke also linked with dryness of the eyes.<sup>9</sup> In this study, 53.57% smokers and 26.78% non-smokers had dryness in eyes. 26.78% smokers and 20.53% non-smokers got puffy eyes. 87.5% smokers and 33.92% non-smokers felt like having something in eyes 20.5% smokers and non-smokers had watery eyes. It had been reported that smoking is a significant irritant associated with itching, having something in eyes sensation, heating of the eyes and sandy sensation. *In this study*, tear strength of smokers was decreased, punctate staining of cornea was increased and the susceptibility of the cornea and conjunctiva was reduced in smokers. Similar findings had been reported in a study conducted in Australia *in which there was significantly reduced corneal and conjunctival sensitivity and punctate staining of cornea had been found among smokers.*<sup>21</sup> *Also smokers had tear film instability.*<sup>22</sup>

## CONCLUSION

Most smokers are having problems in their eyes. As compared to non-smokers they experience more redness, dryness of eyes, puffy eyes, temporary blurriness, and fatigued eyes. They face difficulty while driving at night. They sometime get distorted vision while examining objects in their external environment. Smoking is not linked to the watery eyes. Tear solidity of smokers is decreased.

## RECOMMENDATIONS

To reduce the risk of eye related conditions linked with smoking, there is absolute necessity to increase knowledge of ocular hazards of smoking and create more awareness about mortality risks and provide support and motivation towards cessation of tobacco use. Eye care professionals could play a major role in reducing ocular surface related problems among smokers.

**Table 1:** Comparison of Smokers and Non-smokers.

	Smokers n=112	Non smokers n=112	p-Value
Do your eyes often get red?	67 (59.82%)	30 (26.78%)	0.01
Do you feel any dryness in your eyes?	60 (53.57%)	30 (26.78%)	0.03
Do you feel you often get puffy eyes?	30 (26.78%)	22 (19.64%)	0.02
Do you feel having something in your eyes?	97 (86.60%)	37 (33.03%)	0.02
Do you have watery eyes?	22 (19.64%)	22 (19.64%)	0.02
Do your eyes feel fatigued?	60 (53.57%)	30 (26.78%)	0.05
Do your eyes exhibit temporary blurriness?	82 (71.42%)	37 (33.03%)	0.01
Do you sometimes get a distorted vision?	45 (40.01%)	22 (19.64%)	0.05
Are your eyes sensitive to strong lights?	52 (46.42%)	30 (26.78%)	0.02
Difficulty moving around or driving at night?	67 (59.82%)	15 (13.39%)	0.05
Stringy white mucus accumulate around the eyes?	75 (66.96%)	22 (19.64%)	0.01

**Table 2:** Average screen time per day among smokers and non-smokers

		What is your average screen time per day, in hours				Total	P value
		< 3 hours	3-6 hours	6-9 hours	> 9 hours		
Groups	Smokers	22	30	52	8	112	0.3
	Non smokers	7	52	30	23	112	
Total		29	82	82	31	224	

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