

PREVALANCE OF ASTHENOPIA AMONG DRIVERS

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ABSTRACT

PURPOSE: This study was conducted to determine the prevalence of asthenopia among professional drivers and to study the effects of different symptoms related to asthenopia during and after driving.

METHODS: This was a descriptive cross-sectional study. After taking informed consent, Data of 44 professional drivers was collected using self-designed questionnaire which included general questions related to asthenopic symptoms like visual fatigue, headache, dryness, photophobia and watering etc. The participants included men drivers generally between 32 to 60 years of age group working at Ravi Bus Terminal of Lahore, Pakistan. Study was conducted in the months of September to December 2020.

RESULTS: This study showed that out of 44 male drivers, most of the drivers had been working for more than 10 years. Prevalence of asthenopia was found to be 10%. Out of total, percentage of drivers feeling eye strain was 55% (most common symptom), headache was 27%, photophobia was 12% and watering was 5%. Fatigue (45%) and decreased vision (18%) were considered to be the responsible factors for above mentioned asthenopic symptoms. Fatigue occurring after driving affected 47.7% drivers and it induced somnolence (sleepiness) and blurred vision in drivers temporarily.

CONCLUSION: This study concluded that prevalance of asthenopia was not significant in professional drivers. While symptoms like eye strain, headache, fatigue, photophobia and intermittant blurring were significant in drivers having asthenopia.

KEYWORDS: Prevalence, asthenopia, photophobia.

INTRODUCTION

Asthenopia is a term which appears through several symptoms like tiredness of eyes, headache, blurring of vision, diplopia, light sensitivity and watering. This eye problem is mostly related to near work and it can disturb a person's attention spasm and performance. This condition is believed to be linked with refractive errors, accommodation and convergence anomalies, imbalance of eye muscles, inappropriate light conditions and poor contrast.¹ It is also related to various systemic, psychological and environmental factors. So it is very important to understand its risk factors.²

Asthenopia which is also represented as visual

fatigue is common among drivers and it is directly related to their task duration, routes condition, sleeping pattern and general health.³ If these aspects are compromised, it can lead to some undesired results like traffic accidents.³

Different lights affect differently, for example, red and green cause more discomfort to sight than blue and yellow and drivers have constant interaction with these lights being on roads causing increase in visual discomfort.⁴ This visual discomfort has negative influence on a person's mental and physical health as it can induce visual fatigue, eye discomfort, strain and headache.^{5,6}

A case control study in United States also proved that diet containing lutein and zeaxanthin can reduce the risk of Age Related Macular Degeneration. Lutein and xanthan constitute the yellow part of macula of eye having important role in vision. So green vegetables and yellow fruits are beneficial for eye health.⁵

In some literature, asthenopia is further divided into two categories. One is refractive asthenopia and the other one is muscular asthenopia. As a whole, eye health is of prime importance. It not only affects individual's health but also disturbs economic status of that country leading to the long term effects. Having good and sound health is a key to happy life. And healthy eyes are of no less importance. Healthy life style and good diet plays major role in eye health.^{6,7}

It was concluded that use of Mediterranean diet pattern for six months proved helpful for those suffering from dry eye. It was also favorable for those suffering from systemic diseases.⁶

In Pakistan there is no study done to evaluate the visual functions of drivers and the importance of visual functions or eye health in professional drivers can't be denied. Good vision is not the only one requirement for drivers but the other visual functions like contrast sensitivity, glare sensitivity and visual field also contribute to the safe driving.⁷ While most of the time, drivers are selected without proper vision assessment protocols.^{8,9} So, there is a need to do such studies.

MATERIALS AND METHODS

This descriptive and cross-sectional study conducted in the months of September to December included 44 male drivers who were working for more than 5 years at the Ravi Terminal, Lahore, Punjab province of Pakistan. Informed consent was taken from Participants and those who fulfilled the exclusion and inclusion criteria were asked the questions related to their work environment and ocular conditions. The resulted

data was analyzed by statistical package of social sciences SPSS version 25, and chi square test was used. Results were recorded with frequencies and percentages in the form of tables and bar chart. The study methods adhered to the tenets of the Declaration of Helsinki for the use of participants in biomedical research.

RESULTS

Out of total 44 drivers, prevalence of asthenopia was 10% and most common asthenopic symptoms were eye strain (55%), headache (27%), and photophobia (12%) as shown in figure 1. When compared with working experience of drivers, it was found that eye strain and photophobia were more significant in those drivers who were working since 15 years while headache and diplopia (blurring of vision) was prominent complain of those working for less than 10 years (younger ones). Chi-square test was applied (df=3) and p value was less than <0.001 that shows the significance of these symptoms in different age groups. Similarly fatigue and decreased vision were more significant in older drivers in the ratio of 45% and 18% respectively while lack of sleep was the troubling factor in younger drivers (27%). 45% drivers marked fatigue as the reason of asthenopic symptoms and 18% marked decreased vision as the main reason as shown in table 2. Similarly 47% drivers felt fatigue after driving for long hours and it induced somnolence and blurriness in drivers as shown in table 3.

Figure -1: Frequency of Asthenopic Symptoms Marked by Drivers

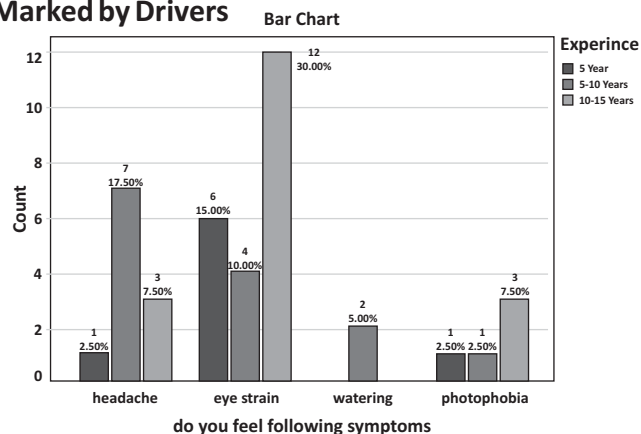


Table -1: Asthenopic Symptoms

Do You Feel Following Symptoms * Working Experience Cross Tabulation						
		Experience			Total	
		5 Years	5-10 Years	10-15 Years		
Do you feel following symptoms	Headache	Count	1	7	3	11
		%	9.1%	63.6%	27.3%	100.0%
	eyes strain	Count	6	4	12	22
		%	27.3%	18.2%	54.5%	100.0%
	Watering	Count	0	2	0	2
		%	0.0%	100.0%	0.0%	100.0%
	Photophobia	Count	1	1	3	5
		%	20.0%	20.0%	60.0%	100.0%
	Total	Count	8	14	18	40
		%	20.0%	35.0%	45.0%	100.0%

Table -2: Causes of Asthenopic Symptoms Marked by Drivers

What do you think is the Reason for Above Mentioned Symptoms?				
	Frequency	Percent	Valid %	Cumulative %
lack in sleep	12	27.3	27.3	27.3
Fatigue	20	45.5	45.5	72.7
Decreased Vision	8	18.2	18.2	90.9
None	4	9.1	9.1	100.0
Total	44	100.0	100.0	

Table -3. Effects of Long Working Hours on Drivers

Do you feel blurred vision or disturbed sleep after driving for long time?		
	Frequency	Percent
Yes	21	47.7
No	20	45.5
sometimes	3	6.8
Total	44	100

DISCUSSION

Driving a vehicle is a complex task. And safe driving demands a lot of concentration. It is influenced by various factors including drivers' visual system, decision making abilities and their focus for different environmental conditions. General

behaviour and attitude of professional drivers also plays a huge role towards safe driving.¹⁰

Eye health of professional drivers plays a very important rule in their work. In this study, visual fatigue generally called as asthenopia was assessed in drivers. Asthenopia represents a group of symptoms including eye strain, headache, blurred vision and eye irritation. Eye strain is considered to be the most common complain related to asthenopia.¹¹

A study was done in Poland to assess the level of fatigue in professional drivers, it was found that out of 398 professional drivers, 89% of drivers suffered fatigue at their workplace and percentage of eye strain was 67%.¹² In our study, most common complain of drivers was eye strain (55%). Proportion of headache in drivers was 27.50%. Photophobia and watering being less common. The most common cause for above mentioned symptoms was fatigue(45.5%) and lack of sleep was also significant(27.3%). Decreased vision being 18.2%. These statistics show the similar results based on high prevalence of eye strain and fatigue.

In this study, all the participants were male drivers as this profession is considered mostly to be male-dominant field so rarely opted by females in Pakistan.¹³ A study showing the effects of age and gender on drivers' road injuries concluded that significant physical and behavioural differences occur between male and female drivers.¹³ Night drivers in our study were 63.3%. Working hours of 50% drivers were 4 to 5 hours. Most of the drivers (38.8%) had been working for more than 10 years. It was found that 75% of our participants had never get their eyes examined. They had examined their eyes only for issuing of driving licences while after that it was not considered important to visit hospitals even after having some of the asthenopic symptoms like fatigue, eye strain and photophobia which can be due to decreased vision or any other reason.

In our research, 43.2% drivers had complain of

photophobia and this was a significant number. It is studied that photophobia can occur in drivers due to ocular and vestibular dysfunction which occurs due to motion (or travelling) even without any presenting ailment.¹⁴

When the vision of drivers was compared with working experience of drivers, out of total, 22.7% of the participants had defective distance vision as shown from their response that they could not see the incoming objects easily and it was significant in older age group ($p=0.001$). While 25% of the drivers who had been working since 10 to 15 years (older ones) were having defective near vision. This happens due to decrease in accommodation and ocular muscles' elasticity with growing age. A study recently done to test the prevalence of refractive errors in professional drivers concluded that out of 140 drivers, 24 drivers (17.14%) had defective distance vision while 74 (52.8%) had presbyopia.¹⁵ These results show the similar results while comparing both studies.

In our research, 40.9% of the drivers wear sunglasses routinely. The percentage of drivers who feel headache in crowded places was significant among participants (43.2%). According to results, fatigue of long driving hours affected 47.7% drivers temporarily. Fatigue occurring after driving a vehicle is a general fact but it can also be a cause of some undesired incidents like road accidents. This work related load can induce various changes. So it is advisable to take short breaks during day as well as for night driving and drivers should also be guided about the value of proper sleep and work condition.¹⁶

The prevalence of asthenopia is gaining importance in literature for over 20 to 30 years due to increasing usage of digital devices. The 2016 digital eyestrain report was done by over 10,000 participants from United States. It concluded that prevalence of self-reported asthenopic symptoms was 65% and females were more vulnerable than males. Also, those using more than one device at a time are more susceptible than those using one

device at a time being 75% and 53% respectively. From 10 marked symptoms of asthenopia, each symptom was experienced by 50% of participants due to use of digital devices. In another study of 426 participants in Spain, prevalence of Digital Eye Syndrome was 53%, which was observed by their response from a questionnaire. As compared to these studies, although some of the asthenopic symptoms like eye strain, fatigue, photophobia and blurred vision are significant in drivers as mentioned earlier, prevalence of asthenopia is less common in drivers as it was found to be 10% in this study.

These working conditions put stress on the importance of physical as well as mental health of drivers. In studies it is found that general fatigue, stress, somnolence and headache are some of the most common conditions affecting drivers' health. So these factors need to be addressed more commonly to create awareness by the administration as well as medical professionals.

CONCLUSION

This study concluded that prevalence of asthenopia was not significant in professional drivers (10%). While symptoms like eye strain, headache, fatigue, photophobia and intermittent blurred vision were significant in drivers having asthenopia.

RECOMMENDATIONS

Following recommendations need to be kept in consideration:

1. Regular eye examination of professional drivers should be done every year.
2. Before issuance of driving license, detailed eye examination of drivers should be done including all the protocols of ocular health.
3. Drivers should be properly guided about the risk of road traffic accidents due to compromised eye health.
4. Eye camps should be arranged for the

screening of asthenopia among drivers.

5. More of the similar studies should be done on a wider range.

People should be guided about the importance of proper diet for prevention of eye diseases especially green leafy vegetables.

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Data collection

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