

AWARENESS AND ATTITUDE ABOUT EFFECT OF SOLAR ECLIPSE ON EYES AMONG GENERAL PUBLIC

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ABSTRACT

PURPOSE: To assess the prevalence of awareness and attitude among general public about effect of solar eclipse on eyes.

METHODS: A cross-sectional study was conducted at COAVS KEMU Mayo hospital Lahore. A self-made questionnaire was made for general public in Lahore. Total of 315 respondents were interviewed. The data was analyzed by SPSS version 25. The confidentiality was maintained. The study was conducted between Septembers to December 2020.

RESULTS: A total of 315 questionnaires were distributed. Overall awareness regarding the harmful effect of solar eclipse was 87%. Females have more knowledge regarding solar eclipse than males. Television was the main source of information. According to 47% participant binoculars or photographic films are safe for viewing solar eclipse. While 28.9% of the participants considered sunglasses and 12.7% of consider smoked glasses safe for viewing solar eclipse. Almost 63% participants thought that solar eclipse had adverse effect on pregnant women and the fetus. 38% of respondents had watched the last solar eclipse, among those 9% watch it directly without any filters.

CONCLUSION: Majority of the general public knows about the ill-effects of watching sun during eclipse. But they do not know the safe ways to watch. Most of people have confusion regarding effects of solar eclipse on pregnant women and its fetus.

KEYWORDS: Solar eclipse, Retinopathy, Maculopathy, OCT, Knowledge, Attitude, Pregnancy.

INTRODUCTION

The eclipse is a natural accident. This is when the moon comes in between the earth and the sun. There are up to seven eclipses (solar eclipse and one lunar eclipse). On average, a total solar eclipse after every 18 months occur in any year.¹ Solar retinopathy, also known as ecliptic retinopathy, eclipse burn or macular retinitis, refers to macular disease caused by long-term exposure to harmful solar radiation.² Since the 18th century, many harmful visual side effects of solar radiation have been recognized, and several cases of solar retinopathy have been reported. The Galileo astronaut was injured while trying to study and

analyze solar radiation. The solar retinopathy after watching sun during solar eclipse due to thermal and photochemical damage has been known since the time of Socrates.³ Viewing sun especially during solar eclipse may cause severe macular damage and self-induced trauma.^{4,5}

Most reports during a solar eclipse are due to eye contact during the eclipse, and direct sunlight during religious ceremonies^{6,7} mental illness.⁸ This type of retinopathy may also increase. In one case, if there is no previous confirmed history of the risk of a solar eclipse, the term "macular retinitis" is used to describe the clinical features of visual symptoms and foveal

lesions.⁹ A solar eclipses only takes a few seconds or minutes to safely see the sun with the naked eye. Without taking special precautions, it is impossible to see the partial lunar eclipse of the partial solar eclipse and the partial phases of the full moon phase, which can never be avoided.¹⁰

If proper protective measures are not taken, it may cause permanent eye damage and blindness. There are two mechanisms by which solar radiation damages the retina. Seeing the sun through binoculars will increase the temperature of the retina by 10 to 25 degrees, causing burns? However, the choroid epithelium is related to photochemical damage of retinal receptor cells when observed with the naked eye, and only involves a 4 degree increase in retinal temperature.¹¹ Children and teens are especially at risk because the lens of the eye filters short wave light before the age of 20. People who have had cataract surgery, those with retinal atrophy or albinism, or those taking photosensitivity medications are also at higher risk.¹³ The latter one signifies the common form of solar retinopathy.

The exposure to solar retinopathy varies. Some people are moderately resistant, while others show symptoms in less than 30 to 60 seconds. There is no pain felt when injured. Symptoms can take several days to mature and include visual acuity, central opacity, poor color vision, and straight deformation. In a study conducted after the solar eclipse Turkey in 1976, about 10% of the victims had permanent vision loss, damage to the point where they were unable to read a license plate 25 yards (23 meters) away with the affected eye or eyes.¹³

MATERIALS AND METHODS

A cross-sectional study was performed among general public to evaluate the awareness and attitude of general public about effect of solar eclipse on human eyes. Total of 315 participants were included in this study. Data was collected by non-probability purposive sampling method in a

self-made Performa, in which several questions were asked. Qualitative variables like gender was presented as frequency and percentages and for other variable suitable statistical techniques applied. Descriptive statistics was used to represent the results like graphs. All the data was presented in forms of frequencies, percentages and appropriate pie and bar charts.

RESULTS

total of 315 questionnaires were distributed. Overall awareness regarding the harmful effect of solar eclipse was 87%. In Table.1 the 54% of the participants have age b/w 20-29. There is direct impact of age on the knowledge and awareness. Females have more knowledge regarding solar eclipse than males.

Table - 1: Age of the Respondent and Awareness Regarding Solar Eclipse Cross Tabulation

Age of the respondents	Awareness that looking at the solar eclipse can damage eye			
	Yes	No	Don't know	N
20	35	3	4	42
<20-29	146	9	15	170
30-44	69	1	8	78
45-59	19	1	0	20
>60	5	0	0	5
Total	274	14	27	315

In Table.2 to different variables and their percentage among male and female is mentioned. Television was the main source of information. According to that 47% participant binoculars or photographic films are safe for viewing solar eclipse. While 28.9% of the participants considered sunglasses films and 12.7% s consider smoked glasses safe for viewing solar eclipse. Almost 63% participants thought that solar eclipse had adverse effect on pregnant women and the fetus. 38% of respondents had watched the last solar eclipse, among those 9% watch it directly without any filters.

Table -2: Percentage Distribution of Awareness of the Participants

Characteristics		Gender		
		Male	Female	Both
Awareness about effect of solar eclipse	Yes	36.83	50.36	87.0
	No	3.17	1.27	4.4
	Don't know	3.81	4.76	8.6
Binoculars are safe for . eclipse viewing	Yes	22.22	26.35	48.6
	No	15.24	19.37	34.6
	Don't know	6.35	10.48	16.8
Photographic films are safe?	Yes	22.54	25.08	47.6
	No	13.65	14.92	28.6
	Don't know	7.62	16.19	23.8
Sunglasses are safe?	Yes	13.02	15.87	28.9
	No	20.32	26.35	46.7
	Don't know	10.48	13.97	24.4
Smoked glasses are safe?	Yes	5.40	7.30	12.7
	No	16.83	18.41	35.2
	Don't know	21.59	30.48	52.1
Believe that solar eclipse can affect unborn child?	Yes	25.08	37.78	62.9
	No	8.57	11.43	20.0
	Don't know	10.16	6.98	17.1
Believe that solar eclipse can affect pregnant women?	Yes	26.03	37.14	63.2
	No	8.25	12.70	21
	Don't know	9.52	6.35	15.9
N		138	177	315

DISCUSSION

In this study, the picture that emerges shows that most of the people of the people knew about the effect of looking at the sun during solar eclipse but issue is that they don't know the proper and safe way. The age group between 20-29 years, almost everyone knew about the harmful effects of solar eclipse on eyes, this is because this age group consists of student and young generation which have more contact with social media and other resources through which they can get knowledge and information. The age group with the highest awareness was older 60 years and above this is because they have spent their life and they know about the effects much more than others. The age group that doesn't have that level of knowledge was under 20 years because this age group consists of young children that belong to schools or colleges; they lack that amount of knowledge. This

study also shows that females are more knowledgeable than males.

Although majority have knowledge about effects of solar eclipse but they lack the information about the safe ways of looking or working during solar eclipse. Most people thought that the binoculars, photographic films and sun glasses are harmless for watching the solar eclipse, but they are not as safe as the people think because they don't provide proper protection¹⁴ and hence they should not be used. The age group that is at greater risk of having eye damage is children. They have risk of photo toxicity because their pure crystalline nature of eye lenses may diffuse some ultraviolet radiations.¹⁵ Due to this child should be prevented from viewing the solar eclipse and their parents should be guided to stop their children from looking at the solar eclipse.

As there is no proper treatment of solar retinopathy¹⁶ so the stress should be on adopting the preventing measures this includes increasing public awareness regarding the safe way to look at the sun during solar eclipse. This can be done by using different Medias such as social media, TV, newspapers and different advertisements. This is really important to prevent the effects before occurring because once retinopathy occurs there is no going back. The institution of health, the royal college of ophthalmologist and the college of optometrist have counseled to not watch the sun during solar eclipse directly.¹⁷

There is one harmless way to view the eclipse and it is being watching the sun indirectly using projection. This can be done by rotating one's back to sun and using a 2mm hole in a card to project sun's image on a second card one meter away.¹⁷ In this way the image of sun can be seen during eclipse. There is another issue which we discuss in this study the harmful effects of eclipse on pregnant mother and her fetus. This was very much prevalent among the public in over study population. It is a myth¹⁸ not realty. These issues

should be taken under consideration and advised properly so that these myths can be removed from the society. Family physician, optometrist and consultants can and should play their role in providing education about viewing solar eclipse to general public. They are the people of great concern regarding this issue.

CONCLUSION

Most people have knowledge about the harmful effect of viewing the solar eclipse but they didn't know the safe way, this is the point to work on. The thing that should be emphasized is to give education about the safe ways of looking at the sun during eclipse. This can be done by using media and campaigns. There is also need to address the myth related the ill effects of viewing eclipse on pregnant women and fetus. Physician, optometrist and the consultants are the main concerns who have to work on this issue by addressing general public.

RECOMMENDATION

Don't view solar eclipse directly. Don't use sunglasses, photographic films, binocular etc. to view solar eclipse because they are most safe. One should view the solar eclipse through indirect method. Children are most vulnerable to retinopathy; therefore, they should be prevented. Harmful effects of eclipse on pregnant women and fetus is a myth and not reality. This issue needs to be addressed so; it can be removed from the society. Eye care professionals and family physicians should provide education to general public about effects of viewing eclipse and using safe ways.

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