

## Solar retinopathy following religious ritual ceremony: A case report from Blantyre, Malawi

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### ABSTRACT

Solar retinopathy is a retinal damage as a result of direct or indirect exposure to the solar radiation. It usually occurs following direct viewing of an eclipse without adequate protective devices. It may also occur following prolonged gazing at the sun, during sun bathing, and in patients with psychiatric disorders such as schizophrenia or drug intoxication.

We discuss the clinical presentation, diagnosis and treatment of a 26 year old woman who developed solar retinopathy after prolonged gazing at the sun during a religious ritual.

**Keywords:** Solar retinopathy, Eclipse retinopathy, Maculopathy, Ultra-violet radiation

### INTRODUCTION

Solar retinopathy is a retinal damage as a result of direct or indirect exposure to solar radiation<sup>1</sup>. It usually occurs as a result of viewing of an eclipse without adequate protective devices. There are also reports of solar retinopathy in the following prolonged direct viewing of sunlight in religious ritual ceremonies, during sunbathing, and in patients with psychiatric disorders through schizophrenia or drug intoxication<sup>1</sup>.

The damage in solar retinopathy is a photochemical injury unlike thermal injury. Ultra-violet (UV) radiation and short wavelength visible light leads to generation of reactive oxygen species, subsequently leading to oxidative retinal tissue injury. Studies have shown that retinal pigment epithelial and outer segments of photoreceptors are the most susceptible to injury in solar retinopathy<sup>2,3</sup>.

### CASE REPORT

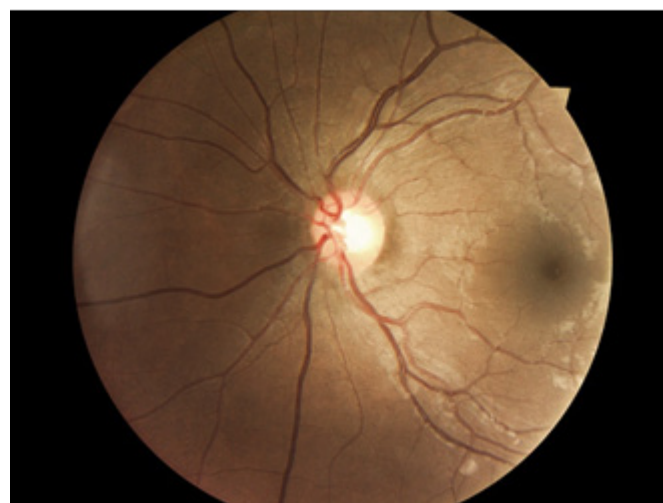
A 26 year old woman presented at the out-patient department at the Lions Sight First Eye Hospital in Blantyre, Malawi in December 2014 with one week history of sudden loss of vision in both eyes. She reported attending a religious event where she was instructed to gaze directly at the sun for one minute by the spiritual leader. She noted blurring of her sight immediately after looking at the sun. Her past ocular and systemic history was unremarkable.

On examination, visual acuity was 6/36 in both eyes, which did not improve with the pinhole test and refraction. The anterior segment intra-ocular pressure and pupils were normal in both eyes without cells in the vitreous. Fundoscopy revealed a small round hypopigmented, yellowish-white, lesion on the foveae in both eyes (Figures 1 and 2).

**Figure 1:** Colour fundus photograph of the right eye showing a small, yellowish-white lesion on the fovea

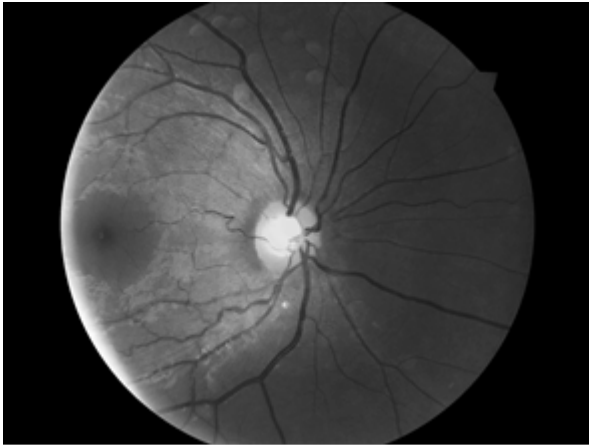


**Figure 2:** Colour fundus photograph of the left eye showing a small, yellowish-white lesion on the fovea

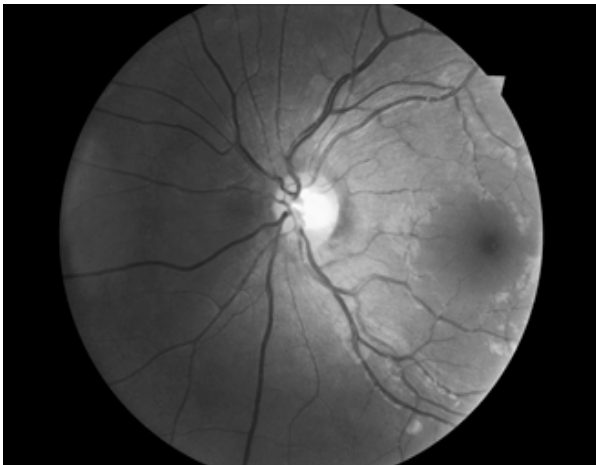


The fundus photographs were also viewed under a gray scale (Figures 3 and 4). Both optic discs were normal. Amsler's grid (white lines on black background) did not reveal any metamorphopsia.

**Figure 3:** Red-free image of right eye fundus



**Figure 4:** Red-free image of left eye fundus



The patient was advised not to look directly at the sun again. She was started on a course of oral steroids for 2 weeks. She was advised to return for follow up, which was scheduled at 2-week intervals. On the first follow up visit, the best corrected visual acuity had improved to 6/18. One month later, vision returned to normal, achieving 6/6 in both eyes. Despite the good visual prognosis, there was no change in size and appearance of the foveal lesions.

## DISCUSSION

Solar retinopathy has been reported in some religious rituals involving gazing at the sun<sup>5</sup>. Solar retinopathy can even occur with very minimal exposure to solar radiation<sup>6,7</sup>. Our patient also developed solar retinopathy at a local religious gathering where she was told to look at the sun for a minute. Young patients, like our patient, are at high risk of developing solar retinopathy because the young natural lens is very clear and thus does not absorb much of the harmful radiation, thereby exposing retina to the radiation<sup>8</sup>.

The patient in this report presented at our eye hospital with a visual acuity of 6/36 one week after the exposure. Our clinical findings were consistent with the solar retinopathy described by other authors<sup>9</sup>. Our patient had yellow hypopigmented foveal lesions in otherwise normal eyes without prior history of retinal disease. The bilateral involvement in our patient is the most commonly reported, although unilateral involvement has also been described<sup>8</sup>.

The use of steroids in patients with solar retinopathy is controversial. Some studies have shown improvement in vision in one to two months from severely reduced vision to normal vision without use of any treatment like steroids<sup>10</sup>. Our patient recovered vision from as early as 2 weeks after the exposure, and regained normal vision by 4 weeks. This rate of recovery is similar to what MacFaul<sup>8</sup> reported among patients with solar retinopathy. He reported that full visual acuity recovery can be expected within a period of one month to 6 weeks if the patient shows early visual acuity recovery and if the rate of recovery of visual acuity in the earliest stages is high. Otherwise vision recovery can go on up to a period of 6 months after the incident<sup>5</sup>.

Relevant investigations in patients with solar retinopathy include visual field, fundus autofluorescence and optical coherence tomography, which are not available at our institution. Visual field is important in patients with solar retinopathy because it may detect central and para-central scotoma<sup>8</sup>. These may cause reading problems or dissatisfaction in a patient with normal visual acuity. Because of reduction of lipofuscin, the area damaged by solar radiation appears to show reduced autofluorescence and is surrounded by a hyperfluorescence ring<sup>11</sup>. Optical coherence tomography would confirm the diagnosis, detect subtle changes and predict the prognosis<sup>9</sup>. Brue *et al* proposed that findings on OCT suggest damage to outer segment of the photoreceptors as a marker of severe solar retinopathy which can result in permanent visual decrease.

## CONCLUSION

Solar retinopathy is hardly described in literature and seems to be a rare condition. There is a need to increase public awareness on how to prevent ocular injury from harmful sun radiation.

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