

Madagascar: The Eclipse Story

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Introduction

On the 21st June 2001 there was a total solar eclipse in Madagascar. The path of totality traversed the Atlantic Ocean reaching land first in Angola, followed by Zambia, Zimbabwe, Mozambique and across southern Madagascar before it ended in the Indian Ocean. A total solar eclipse was visible in Madagascar at 4:28 pm. The track of totality extended at this time about 150 km wide and crossed the country from the west to the east. A partial solar eclipse was visible in the rest of Madagascar.

Cases of solar retinopathy are well documented, either in those people exposed for long periods of time to the sun, or those using magnification lenses (telescopes and binoculars).¹ This results in a photochemical insult or true retinal burn to the retina; the latter having a poor prognosis for recovery.

The Study

In the six weeks leading up to the eclipse, we conducted a survey to gauge the viewpoints of the Malagasy people and the measures that had been instigated by the Malagasy government in order to reduce the incidence of eclipse related retinopathy. The survey population consisted of clinic attenders at the eye department in Fianarantsoa which was adjacent to the area of eclipse totality and is the principal eye unit for the southern one third of the country. One hundred people were interviewed before the event and those attending up to 4 months after with eclipse related problems were recorded.

Results

We found that all 100 patients interviewed had received some information on the eclipse which came from a variety of sources (Table 1).

However, in the month preceding the eclipse, only 24% of people actually owned a pair of eclipse glasses. These glasses were mainly bought in the pharmacies or handed out at hospitals (Table 2).

Of the 74 patients who did not own a pair of eclipse glasses, 14 patients were waiting for free handouts of the glasses and 10 patients did not know where to find the glasses. The remainder would either not watch the eclipse or simply had not got round to purchasing a pair of the glasses. Patients were also asked their plans during the actual eclipse period (Table 3).

When specifically asked what were the dangers of the eclipse, 99% of patients knew that blindness was the main hazard.

Preventive Medicine

The study we conducted was possibly biased, in that the sample population was mainly town based and therefore more exposed to the media. From our survey, the effort of the government and others to educate the public had been successful. Four months prior to the eclipse there was a daily half hour broadcast on television and radio to discuss the eclipse and what actions were needed. Information was also given in schools and there was even talk of parachuting people into the remote areas of the country to walk around giving advice. We saw several posters advising people to purchase eclipse glasses, and how to wear them, and also to keep their children indoors. Rural healers spoke of the eclipse as being 'a powerful event' and strong advice was given to stay inside. This was reflected in the results in our survey. A factory in the capital made the special glasses.

At another eye hospital, workshops had been set up to educate village volunteers, who would then take the message back to their respective regions. The lectures were designed to inform people on what eclipse glasses were and how to use them. The talks also encouraged people to stay indoors if they did not own a pair of protective spectacles. Eclipse glasses were being sold at 2500 Malagasy Francs a pair (approximately a day's pay). Cost was evidently a problem for some.

Table 1: Sources of Information Concerning the Eclipse

Radio	70 %
Television	53 %
Lecture: Authorities	11 %
People: friends	11 %
Posters	9 %
Newspapers	6 %
School	5 %
Museum	2 %
Church	2 %

Table 2: Where Patients Obtained their Glasses

Pharmacist	9 %
Distribution (hospital, voluntary groups, Lions Clubs)	9 %
School	1 %
France	1 %
Other ways	4 %

Table 3: What Will You Do During the Eclipse?

I will stay inside	58%
I will watch the eclipse	26%
I have not decided yet	10%
I will be abroad	2%
I will watch if I get free eclipse glasses	2%
I will pray	2%

One of the main problems we came across was the misinformation that was circulating. People spoke of how the eclipse glasses could transmit blinding diseases or that the eyes of the Malagasy were strong and the eclipse would only affect the weak eyes of the foreigners. A common pre-conception was that this event marked the end of the world – so who cared about their eyes? One young villager was less concerned about his own eyes than those of his cattle or the lemurs in the rainforest. "Who will protect their eyes? They do not understand like us", he asked with a blank expression. Some people believed that Madagascar was to be the only country to be affected by the eclipse, and that this was probably due to the Vazaha (white people) who had brought the problem with them from abroad. It seemed that the eclipse might even mean the arrival of God to the capital city.

What Happened?

It seemed that most of the population stayed indoors during the eclipse and heeded the advice of the local healers. One BBC correspondent, who spent the eclipse in a large village in a dry forest to the west of the country, commented that out of the 5000 villagers only 12 actually ventured out to watch the eclipse. There were far more tourists who flocked to the southern

reaches of Madagascar in order to catch a glimpse of the solar eclipse.

Our study audited the incidence of solar maculopathy post-eclipse presenting to the eye clinic. Five months after the event there had been no reported sightings of eclipse related retinopathy. This was in stark contrast to a study in the UK² which reported 70 cases of temporary visual loss after the 1999 eclipse. They reported no cases of permanent visual disturbance 6

months later. Rai et al³ in a study in Nepal audited the incidence of solar maculopathy over a 20 month period. They found that 40% of the 319 cases were eclipse related.

Conclusion

The Malagasy eclipse experience highlights the fact that an underdeveloped country can provide effective public health education. Clearly the beliefs of the population played an important part in keeping a

large percentage of people indoors during the eclipse.

References

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Report

Comparison of Cataract Surgery in a Base Hospital and in Peripheral Eye Camps

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The Base Hospital approach (reach in) and Peripheral Eye Camp approach (reach out) are both community-orientated approaches to tackle the backlog of cataract blindness under the National Programme for the Control of Blindness. Both have proved effective and each has its merits and demerits. Both rely on community participation, intersectorial coordination and appropriate technology at an affordable cost.

We studied 3130 patients operated on for cataract by the Lions NAB Eye Hospital, Miraj (Base Hospital) between 1st January and 31st December 1996 and 1135 patients operated on at 58 Peripheral Eye Camps by the Sangli District, Mobile Ophthalmic Unit and the National Association for the Blind, in the same period. Follow-up was done one week, 3 weeks and 6 weeks after surgery.

The Base Hospital conducted diagnostic camps in the periphery and patients were moved to the Hospital, accounting for 80% of the patients, with the rest being 'walk-ins'. Patients were evaluated using the slit-lamp biomicroscope, keratometry and A-scan where necessary. They underwent planned extracapsular cataract extraction with a posterior chamber intraocular lens implant (58.2%) under a microscope with use of viscoelastics. They were re-transported after dressing the next day.

The Peripheral Eye Camps were conducted in Rural Hospitals or Primary

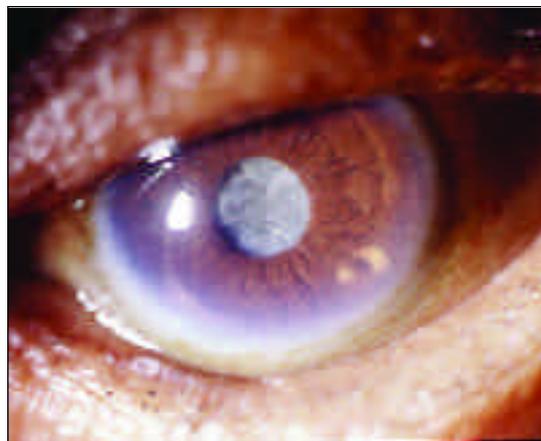
Health Centres in permanent operation theatres, using sterile procedures. Diagnostic camps were conducted at the same site and the patients operated on the next day with intracapsular cataract extraction under an incandescent lamp. Dressing was done on the first and third day by the operating surgeon, followed by discharge.

More women were operated on in Peripheral Eye Camps (59.1%) as compared to the Base Hospital (48%) as their carers were reluctant to transport them far. The very young and very aged were predominantly operated on in the Base Hospital because of the presumed quality of surgery and better management of complications.

Even in the periphery, 92% of patients or their carers were aware of IOL implantation surgery. Only 8% were unaware. Inability to pay was the chief reason (80%) for operating without lens implantation. Only 12% had fear or misconception about something put in their eyes. This means that a larger demand for surgery exists in the periphery for which we must prepare.

Final corrected visual acuity was much better in the Base Hospital (82.7% > 6/18) as compared to Peripheral Eye Camps (43.7% > 6/18). There is a significant difference between post-operative visual acuity in these groups. Microsurgery, viscoelastics and retinoscopic refraction gave a statistically significant qualitative improvement in vision. Base Hospital surgery resulted in better and earlier visual rehabilitation.

The Professor had significantly better results than all other categories. It should be noted that more experienced surgeons operated on more difficult, 'guarded prognosis' cases. (Professor: 95.2% > 6/18;



Mature cataract

Photo: John DC Anderson

Medical Officers/Registrars: 82.6% > 6/18; Senior Residents 86.5% > 6/18; Junior Residents : 76.3% > 6/18).

However, post-operative follow-up in the Base Hospital was very poor; only 52.7% patients turned up regularly on their own. For the rest, we had to do active follow-up in rural areas. Peripheral Eye Camps boasted 99.1% follow-up as they were conducted near to the patients' homes with the help of ophthalmic assistants who had close community contacts. The Base Hospital should have satellite outposts to ensure better patient follow-up and compliance. This will strengthen its network in the community.

Complications with both approaches were equally found, though the Base Hospital operated on all the difficult cases. Also, all Peripheral Eye Camps were conducted in permanent operation theatres. Vitreous loss was the chief cause of low post-operative vision (1.8% in the periphery and 3.3% at the Base Hospital). Posterior segment pathology was responsible for most others (3.7%).