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An assessment of the usefulness and acceptability of eye shields under field conditions

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Summary Fifteen patients with varying degrees of lagophthalmos and neuroparalytic keratitis were fitted with eye shields made in the field, and an assessment at 1 and 2 weeks has shown that there is a definite improvement in the eye condition and that the community's acceptance of such a procedure is good. For introduction into the present leprosy control programmes, an evaluation of the paramedical workers has shown that they require only minimal additional training.

Introduction

Neuroparalytic keratitis and keratitis with lagophthalmos resulting from paralysis of the fifth and seventh cranial nerves respectively, commonly lead onto subequatorial or total blindness. In view of the fact that these lesions are common in leprosy (1% in South India) and easily preventable by timely tarsorraphy or a temporalis transfer, this constitutes one aspect of leprosy rehabilitation which has been grossly neglected, and thus needs immediate and early action. The risk of irreversible eye damage increases with each passing day that the patient stays away from hospital, due to numerous socio-economic reasons prevalent in his own surroundings. It is for this interval (that is between diagnosis and treatment) that we require a simple measure, which, in addition to affording protection to the eyes, is cheap and easily constructed in the field, on the spot, by the paramedical worker (PMW) in the absence of a doctor, who is the point of first contact between the patient and the hospital.

The above is merely to emphasize the need for a study of the acceptability and usefulness under field conditions of the eye shield so as to introduce it on a large scale in the present leprosy control programmes.

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Preventive opthalmology still does not figure predominantly in the country's community health programmes, and least of all in the field of leprosy. Its introduction is urgently needed since the rehabilitation of the Hansen's patient is made much simpler and far more rewarding if this aspect of his well being is not neglected.

Objectives

1. To evaluate the effect of wearing an eye shield under field conditions.
2. To evaluate the acceptability of the shield by patients, with special reference to the social problems that it could create.

Materials and methods

The study was conducted in two regions of North Arcot District, South India (Gudiyatham and Vellore) under the auspices of the Schieffelin Leprosy Research and Training Centre, Karigiri and Rural Health Centre, Bagayam. Fifteen patients were studied – 14 out-patients and 1 in-patient. The distance on closing the eyelid varied from 2 to 15 mm, thus eliminating any discrimination with regard to the degree of lagophthalmos. The patients had varying degrees of epiphora, conjuctival injection, circum-orbital itching and dimness of vision. Three weekly visits were made along with the PMW to the patients' homes and an assessment of the shield and the eye was made at intervals of 7 days. They were then asked to come to hospital for definitive treatment of their ocular condition.

A *pro forma*, made after pre-testing with 4 PMWs and 1 doctor, was filled in. A provision was made for the assessment of:

1. The condition of the eye evaluated subjectively and objectively before and after shield application.
2. Changes in the condition of the shield after use.
3. Social problems which the patient might encounter during the course of the 2 weeks.
4. The condition of the skin after prolonged plaster application.

A grading for all the eye symptoms and signs was prepared and used to compare the changes in the eye before and after shield application.

The *pro forma* was filled in by the PMW after prior instruction and was further counter-checked by the doctor present. The mistakes made were noted and this, combined with a simple test given to 27 PMWs later, has been used to assess their attitudes towards (and knowledge of) eye complications in leprosy.

Patients with bilateral lagophthalmos had a shield fitted into one eye only, so that the other could act as a control.

CONSTRUCTION AND APPLICATION OF THE SHIELD

Materials required:

1. Adhesive plaster 3″ x 6″.
2. Plane glass (circular or square in shape as in spectacles).
3. Razor blade.
4. Spirit, tincture benzoin and cotton wool for local preparation of the skin.

The adhesive plaster is laid on a clean non-sticky surface. A hole 10 mm less in diameter than the size of the piece of glass to be used is cut out. The cleaned glass is then placed on the sticky surface of the plaster and fixed on to it by small strips of plaster applied to its edges. The contour of the shield is fashioned according to individual requirements so as to exclude beards, nose rings, etc. Prior to shield application the skin is cleaned with spirit and then painted with tincture benzoin for better adhesion. If the shield is reasonably air-tight it becomes misty from inside, an observation that serves as a quick guide as to whether it has been applied correctly. The mist clears almost immediately. Each shield takes about 15 min to make at first, and costs very little.

Results

The population studied consisted of 15 patients of whom 12 (80%) were men and 3 (20%) were women, residing in towns (5 people – 33.3%) and villages (10 – 66.7%). Four of them had already undergone previous surgical treatment (3 had undergone tarsorraphy and 1 a temporalis transfer); 4 of them had corneal opacities of varying depth and shapes; only 5 (33.3%) had corneal anaesthesis accompanying the lagophthalmos. The distribution of the type of Hansen's disease is shown in Tables 1 and 2.

Table 1

Lepromatous leproma	10
Borderline leproma	2
Borderline tuberculoid	1
Tuberculoid	2

Table 2

Duration of disease:	
Under 5 years	9 (60%)
6–10 years	3 (20%)
Over 11 years	3 (20%)

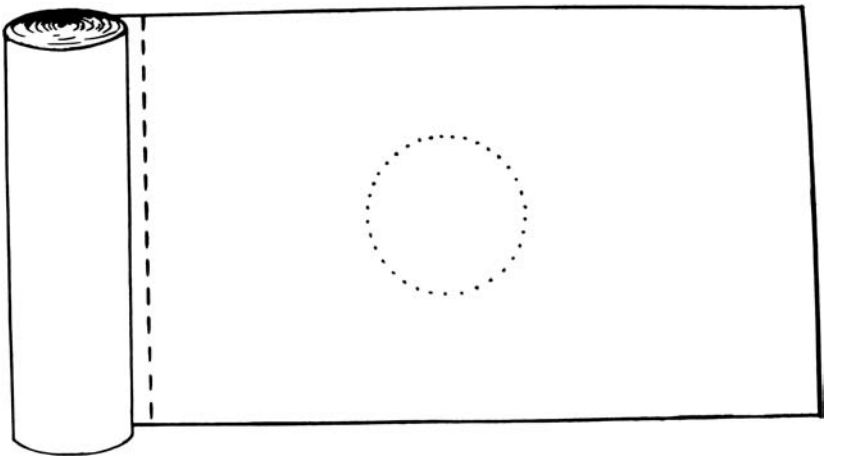

Figure 1

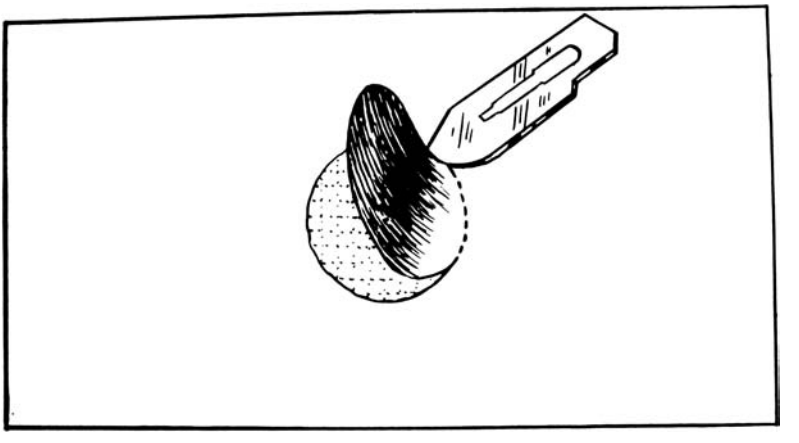

Figure 2

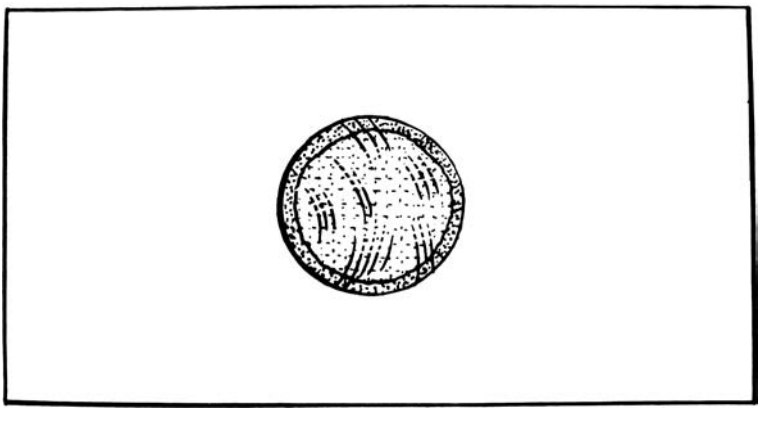

Figure 3

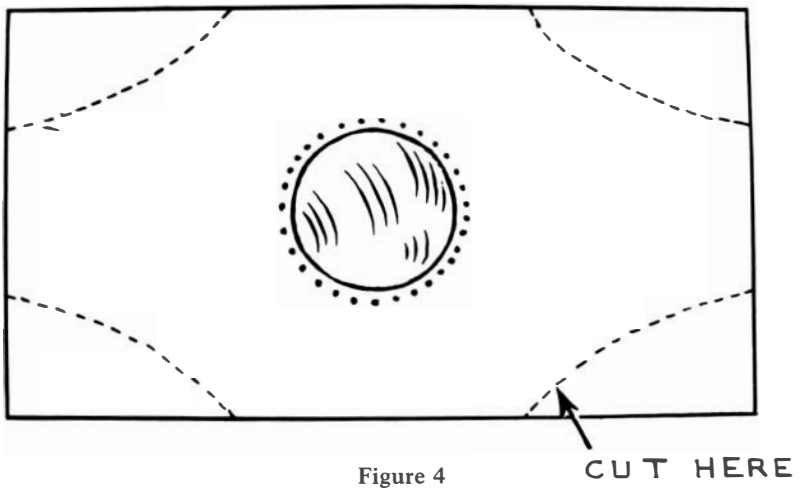

Figure 4

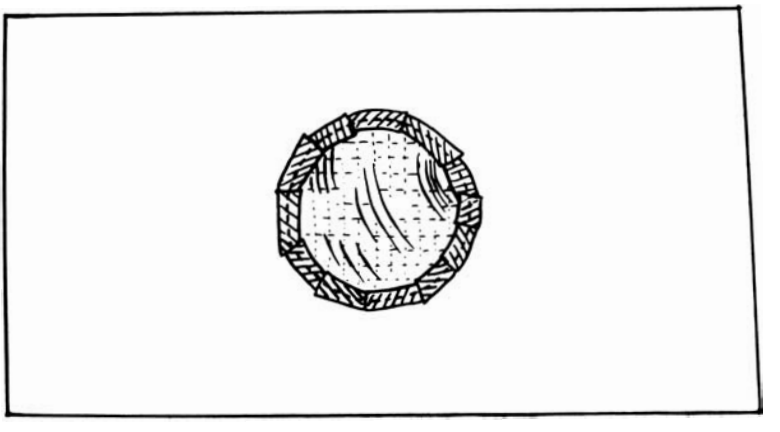

Figure 5

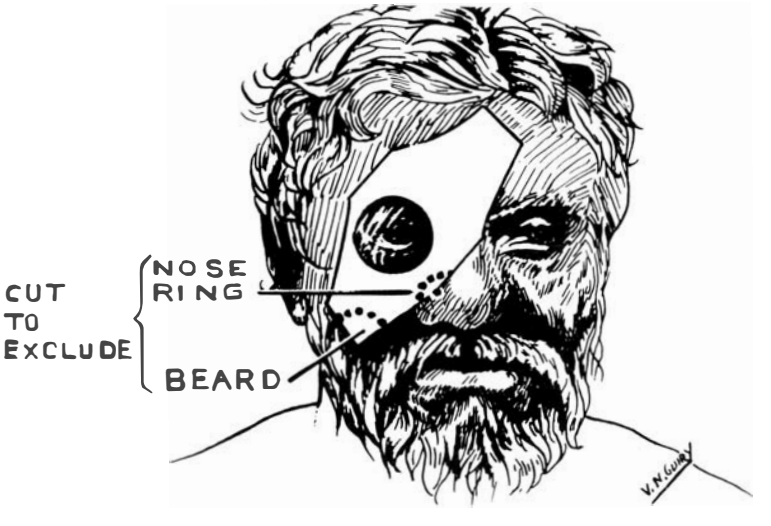

Figure 6

None of the patients were blind. All the patients were on regular treatment. Of the 15 patients originally selected, 3 were initially unco-operative, 1 of them removed the shield soon after application, 1 could not be traced, and 1 continued wearing the shield for the full period of 2 weeks. In 8 (61.5%) patients epiphora was an aggravating factor in addition to the lagophthalmos, 6 (75%) of the patients had ectropion; 2 (25%) of the patients had foreign bodies in the eye. These were removed before applying the shield. Five of the 15 patients had bilateral disease. The results presented in Table 3 are those of the 13 patients who could be followed up.

Table 3. Eye changes after shield application (2 weeks later)

	Initial		Marked improvement		Mild improvement		No changes	
	No.	%	No.	%	No.	%	No.	%
Watering	12	92.3	9	75.0	2	16.7	1	8.3
Itching*	10	76.9	9	90.0	1	10.8	–	–
Redness†	13	100.0	10	76.9	2	15.38	1	7.69

*Itching developed in 1 patient after wearing the shield.
†Redness appeared in 1 patient.

Figure 7. Initial condition of the eye.

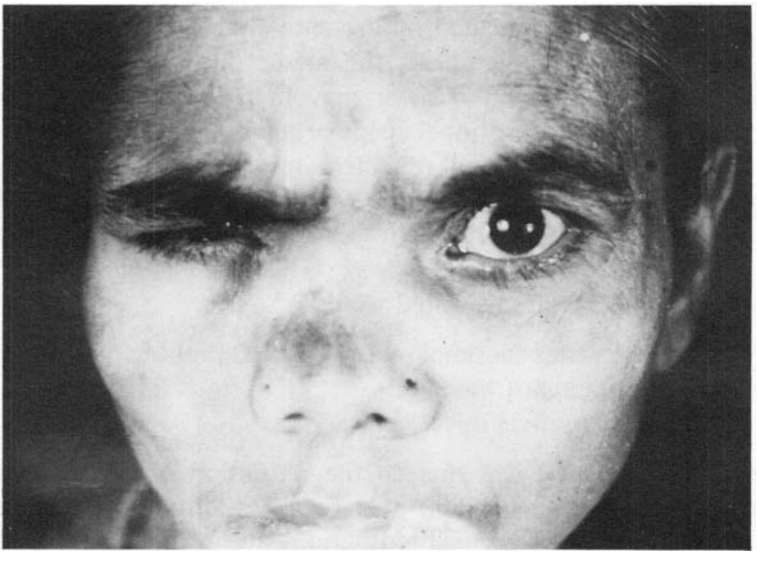

Figure 8. After 2 weeks of shield application.

The complications noted are shown in Table 4. The assessment of the PMWs showed that though all were aware of lagophthalmos and could recognize it, they were unable to recognize:

1. Cataract.
2. Scleritis.
3. Iridocyclitis.
4. Ectropion.

Twenty-six (96.3%) of the 27 were able to recognize the parts of the external eye correctly.

Table 4

Complications	No.	%	Patient complained of the symptom
Discharge collected in the chamber	2	15.39	Yes
Allergic manifestations	2	15.39	No
Dimness of vision	7	53.09	Yes (3), no (4)

Discussion

The study demonstrated the adequate functioning of the shield. During the 15 days that the 13 patients wore it, there were only five instances of the shield

coming off. This was due to sweating, carelessness, displacement during sleeping and in 1 patient it followed a drinking spree. This difficulty can be offset by using spirit to thoroughly clean the skin, followed by tincture benzoin application. The use of porous plaster may help further. The shield can also be reinforced by applying additional strips of plaster.

There was symptomatic and objective improvement in all the patients. In the series there was only 1 patient who had no change in the amount of epiphora and conjunctival injection. In this case the shield had become unstuck on the nasal side.

The major beneficial effects noted were:

1. A decrease in the reflex lacrimal secretion and epiphora.
2. Decrease in the itching of the eye.
3. A decrease in conjunctival injection.

The improvement noticed was due to the reduction of irritation to the eye from dust and other agencies, and also to a reduction of the desquamation of the superficial layers of corneal epithelium due to dessication. In addition, since the cornea is kept moist, the degree of reflex lacrimation is drastically reduced. The complications arising from application of the shield are very minimal and can be ignored. The shield can further be adapted for patients with photophobia by using a dark glass.

The major problem anticipated was an adverse reaction by the community to the shield. It was very surprising to note that the interaction between the patient and the community was in fact favourable. Some patients made excuses such as the shield was meant to treat a foreign body in the eye, others said it was a preparation for an operation. Some of the villagers were very happy since something was at last being done to help the patients and improve their condition. 'What does it matter how it looks as long as Abdul is benefiting from it', said one.

None of the patients was made fun of or rebuked in any way. An initial unco-operative patient removed the shield on going home as he strongly felt that it would interfere with his job in the local cinema. This is in contrast to a villager who was unco-operative but continued wearing the shield. On being asked the reason, he said that it was because of the comfort that he obtained from its usage. Hence it appears that the shield is not a source of ridicule and rejection of the patient by the community, nor does it add to the stigma of leprosy.

Finally, an assessment of the PMWs has shown that there is a need for teaching them the basic technique of evaluation of the eye as well as the importance of the major lesions in leprosy.

It must be emphasized that this is a temporary measure meant to provide relief and afford protection to the eye, rather than to act as a cure.

Such a procedure, simple yet so useful, does not require any special effort, since it can be incorporated smoothly into the existing leprosy control

programme without requiring any special equipment. The materials required to make the shield, apart from the glasses, are part of a normal village clinic equipment and hence the introduction of the shield could be started as soon as the PMWs have been trained.

Acknowledgements

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