Leprosy

The changing face of leprosy

K J Thompson

Still a cause of preventable blindness

The word "leprosy" tends to conjure up images from the past including the "lepers" described in New Testament times, perhaps as seen in the film *Ben Hur*, or those for whom "leper windows" were constructed in churches throughout Europe in medieval times. The fact that the term "leper" is now rendered obsolete in describing a person with the treatable mycobacterial disease known as leprosy, or Hansen's disease, seems to have passed many people by. Speaking of leprosy in the current day context usually evokes a cautious curiosity in lay circles or, in Western medical circles, the admission of having no more than a line or two of textbook knowledge on the subject, and genuine interest in the fact that it can involve the eyes. Hansen's statement that "there is no disease which so frequently gives rise to disorders of the eye as leprosy does,"¹ may no longer hold true. However, despite the advent of multidrug therapy (MDT) in the early 1980s, leprosy remains a significant cause of visual impairment in countries where it is still prevalent.²

The prevalence of leprosy has been decreasing over the past 15 years, but as a sequel to the World Health Organization's drive to encourage governments to aim for the elimination of leprosy by the year 2000, improved case finding in some countries, including India (which has approximately 70% of the world's leprosy affected population), is thought to have contributed to an apparent increase in the observed incidence of new cases during the 1990s.³ This increasing incidence rate continues in some countries, and in the top 10 leprosy endemic countries, 65 000 children were diagnosed with leprosy in 2004. In India, however, over the past 2 years, there has been a 45% decline in new cases detected. This is thought to be related, in part, to changes in diagnostic classification and in leprosy control strategies. However, the 7% annual growth in the Indian economy for the past 4 years,⁴ with an improved standard of living for some, and greater resources available for health care, may also have contributed. The concern is to ensure that it is not simply an apparent fall in incident cases as a result of less

efficient case finding in integrated primary healthcare programmes, which have taken over from leprosy control programmes in many parts of India (and in some other leprosy endemic countries) since 2000, but a real reduction.

Health education and awareness building programmes have borne fruit among some sections of the public. Patients who attend for treatment at an early stage of the disease, who maintain their livelihoods, and who remain with their families are a testament to this. However, there is still a long way to go in this area, and a significant proportion of resources allocated to leprosy, particularly in the voluntary sector, deals with the social consequences of stigma and exclusion with which leprosy is still associated. Rural and less well educated communities may manifest these attitudes the most, but sadly, some urban, educated communities still show little willingness to let go of the old prejudices born of ignorance. With cable television and the internet, such communities have ready access to world media publicity. Western materialism and individualism now tend to take priority over community awareness and healthcare provision for the disadvantaged, while prevailing prejudicial attitudes to leprosy may remain unchallenged.

To prematurely consign leprosy to the history books guarantees unnecessary future morbidity

In ophthalmology, we face the additional challenge of convincing our non-ophthalmic professional colleagues of the need for dedicated specialist resources for optimum prevention of blindness strategies in leprosy. Since much of the early ophthalmic morbidity in leprosy is asymptomatic, reliance on the patient to report problems, or on a cursory look at the eyes while charting skin lesions or testing muscle function, is far from adequate. There are many good eye care programmes, some of which have been in place since the early days of MDT. However they are not yet universally accepted as a necessity wherever leprosy is being managed. Eye complications, such as mild orbicularis oculi weakness

causing epiphora, or uveitis, which may be acute, or chronic and low grade, can be the presenting feature of leprosy. Furthermore, as the paper by Daniel and colleagues in this issue of *BJO* (p 568) demonstrates, eye problems may commence and progress during treatment with MDT. Patients known to have persisting disability after cure (that is, after treatment, and after a period of surveillance) include a significant number with impaired corneal sensation and/or lagophthalmos (often with accompanying nasolacrimal obstruction) or recurrent iritis or scleritis, which constitute a continuing risk of blindness. These patients require long term follow up. Impaired corneal sensation is sometimes forgotten as a sight threatening complication of leprosy. It may be difficult to ascertain in field conditions, but patients with impaired corneal sensation alone are at much higher risk of corneal injury than are those with lagophthalmos and intact corneal sensation.⁵ Where the sight is already impaired as a result of cataract, or previous scleritis or iritis, the risk of corneal damage is even higher.

Daniel *et al* studied a cohort of patients with multibacillary leprosy over the 2 year period of MDT; 9.6% had sight threatening leprosy related ocular complications at the commencement of MDT. A further 5.8% patients per year developed new leprosy related sight threatening ocular complications during treatment. It has been observed previously that complications as a result of nerve damage or inflammation caused by erythema nodosum leprosum often occur when there is instability in the immune response to *Mycobacterium leprae*. Thus, such complications are associated with borderline disease (Ridling Jopling classification),⁶ and with commencement of MDT, as the results of this study show. However, ocular complications also occur in the more stable, or non-borderline forms of leprosy, particularly lepromatous leprosy, and may occur when treatment has started late in the disease, or many years after treatment has been discontinued. The authors admit that their results show bias in terms of early diagnosis, good compliance, and little loss to follow up because their study was carried out in a well established research and teaching institution. The incidence of ophthalmic complications during MDT is likely to be higher in many other areas because, with less awareness of the disease and greater stigma associated with diagnosis, patients are likely to present later, and may not comply satisfactorily with treatment.

It is interesting to note that the distribution of ocular pathology described in this study differs significantly from what would have been observed in the early days of MDT.

This provides useful information for planners of eye care programmes in leprosy management, and further similar studies elsewhere would provide additional helpful information.

Since the early 1990s, much has been done to reduce leprosy related eye pathology to current levels. The difficulty is often in maintaining the momentum of eye care strategies. There is a need for (1) adequate numbers of ophthalmologists trained in leprosy, with a teaching as well as a clinical remit; (2) adequate numbers of ophthalmic trained nursing and paramedical personnel; (3) adequate measures for continuing education of paramedical personnel, maintaining and increasing their ophthalmic clinical examination and diagnostic skills; (4) adequate ongoing health education of patients and the vulnerable public regarding the eye complications of leprosy and the need for early diagnosis. It is known that, at present, the main cause of blindness in leprosy is cataract.⁷ Although, in some instances, other ocular pathology coexists, most patients gain some improvement in visual acuity with cataract surgery (unless obvious

contraindications are present). Resources allocated to dealing with this backlog of patients, and to other blindness prevention strategies in leprosy, would reduce the need for longer term resource allocation to care of the visually handicapped or blind, as well as improving the quality of life and possibly restoring economic and social independence for many.

The World Health Organization's aim to eliminate leprosy as a public health problem, by bringing the prevalence down to less than one per 10 000 by the year 2000 was not achieved in a number of countries, where it has been extended to 2010.³ The focus is now, perhaps rightly, on AIDS which is numerically a larger problem, and one with a rapidly increasing prevalence and a high mortality rate. However, to prematurely consign leprosy to the history books guarantees unnecessary future morbidity, including blindness, with inadequate knowledge and resources to manage it effectively.

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Correspondence to: K J Thompson, Tennent Institute of Ophthalmology, Gartnavel General Hospital, Great Western Road, Glasgow G12 0YN, UK; kirsteenjt@doctors.org.uk

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Exfoliation syndrome

Exfoliation and carotid stiffness

M Irkec

Casual or causal?

Exfoliation syndrome (XFS) is an age related and a generalised disorder of the extracellular matrix, characterised by the production and progressive deposition of fibrillar extracellular material in many ocular and extraocular tissues. XFS represents the most common identifiable cause of open angle glaucoma and may even account for the majority of glaucoma cases in some countries.¹ The exact aetiology of this systemic condition remains unknown. Current literature suggests that prevalence of XFS increases as the mean age of the general population increases, and in some geographic regions 5–40% of the general population over the age of 70 years may show evidence of exfoliation material (XFM) on clinical examination.² In the generalised process of exfoliation, the skin, heart, lung, liver, kidney, cerebral meninges, and gall bladder are also involved. Microscopically, focal exfoliation deposits were shown to be present

in the interstitial connective tissue of these organs, often close to elastic and collagen fibres, fibroblasts, and blood vessel walls. Intraocular and extraocular XFM display similar ultrastructural and immunohistochemical features.³ The basis for vascular connections of XFS has been underscored by the studies that showed an association of vascular walls and elastosis with XFM.^{4–7}

In XFS, systemic vascular associations reported include angina, hypertension, myocardial infarction, stroke, and abdominal aortic aneurysm.^{8,9} However, no clearcut association of XFS with a systemic disease has yet been shown. Comorbidity with acute cerebrovascular disease and chronic cerebral diseases, such as senile dementia, cerebral atrophy, and chronic cerebral ischaemia, were more common in patients with exfoliation glaucoma (XFG) than in patients with primary open angle glaucoma.¹⁰ Conversely, no significant difference was demonstrated

in the 15 year cumulative mortality from cardiovascular and cerebrovascular diseases between patients with ocular exfoliation and the general population.¹¹

Interestingly, a number of studies have shown that elevated plasma homocysteine (Hcy) is more common in XFS and XFG patients than in healthy controls.^{12–15} Furthermore, XFS and hyperhomocysteinaemia (HHcy) share common associations with various disorders. Homocysteine is a sulphur containing amino acid that occurs in a number of forms in plasma. Homocysteine is formed during the metabolism of the essential amino acid methionine, and is largely catabolised by trans-sulphuration to cysteine. It may also be remethylated to methionine in a reaction catalysed by methionine synthetase, which uses methyltetrahydrofolate as a methyl donor and cobalamin as an essential cofactor.¹⁶ Regulation of homocysteine is dependent on nutrient intake, especially folate, vitamins B6, and B12. Thus, the increased dietary intake of methionine, when often combined with other dietary (vitamin deficiencies) and/or genetic (enzyme abnormalities) factors, is a general cause of HHcy in humans. Under normal physiological conditions, Hcy blood concentrations increase gradually with age. In the general population, HHcy has been confirmed to be much more common than originally believed, with an estimated prevalence of 1:70.¹⁷ Many factors have been identified as determinants of