

Prevention of Blindness in Leprosy in Africa  
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The problem of eye involvement as a cause of disability in leprosy is well recognised. (1) Often, however, the focus is on the unique pathology, rather than the significant impact on the stigma associated with leprosy and on the quality of life of people affected by leprosy. Lagophthalmos, besides being a condition that is potentially blinding, is also disfiguring and disabling, perpetuating the stigma associated with leprosy. Vision loss, whether due to cataract or corneal disease secondary to lagophthalmos, significantly decreases quality of life. As life expectancy is increasing worldwide, the prevalence of visual impairment and blindness, associated with aging, is also increasing. For these reasons we must continue to address the problem of eye disease in leprosy in Africa.

Recently, the primary shift in the discussion of ocular leprosy has been from the clinical conditions found in patients affected by leprosy to a discussion of the best approaches to integrating eye care and leprosy control activities to increase awareness, access to, and acceptance of eye care services by people with leprosy.

In Africa it is recognized that there are deficits in the number of eye care professionals; in some countries there are fewer than one ophthalmologist per one million population. Consequently, it should be recognized that access to and the quality of service delivery received by leprosy patients will only be as good as that which is available to the general population. Nevertheless, with the recent launch of the VISION 2020 Initiative (2) to achieve elimination of avoidable blindness by the year 2020 there have been significant improvements in planning for eye care delivery in Africa. Clearly, blindness cannot be eliminated; the initiative focuses on those causes of blindness that either can be prevented (e.g., trachoma, onchocerciasis) or cured (e.g., cataract). By putting systems into place in Africa it is hoped that utilisation of services such as cataract surgery can be high enough in a defined population that no one becomes blind due to cataract. It is critical that leprosy patients be integrated into these national and district VISION 2020 programmes to ensure that avoidable blindness is eliminated in leprosy patients at the same level as in the general population.

### **Burden of potentially blinding eye disease in leprosy patients in Africa**

Findings from the Longitudinal Study of Ocular Leprosy (LOSOL) has indicated that approximately 11% of newly diagnosed MB patients will have potentially blinding ocular pathology at the time of their disease diagnosis. (3) Findings suggest that there is little difference in the prevalence of ocular pathology between different countries, once age and other demographic factors are controlled for in the analysis. Older patients have a considerably higher risk of having eye disease, probably due to a wide-range of reasons, than younger patients at the time of their disease diagnosis.

Work carried out among Tanzanian patients currently on MDT (n=371), sampled from regions listed as endemic, suggest that 13.5% have some form of leprosy related ocular disease and that 9.4% have potentially blinding pathology. Blindness (<6/60 in the better eye) was recognized in 6% of the study population. Similar to the LOSOL study, old age was associated with potentially blinding pathology, as was the duration between recognition of clinical signs (by the patient) and enrollment in MDT. Cataract was the leading cause of vision loss and few of the patients had sought eye

care services. Separately, a study carried out in Nigerian leprosy villages (4) demonstrated a three-fold higher prevalence of potentially blinding pathology and a three-fold higher prevalence of blindness (17.9%). In both settings it was noted that these patients were not part of any routine, integrated eye care service.

### **Guidelines for the management of eye disease in leprosy and for integrating leprosy patients into general eye care services**

In 2001 ILEP sponsored a workshop of leprosy control programme managers, ophthalmologists, epidemiologists, and others to develop guidelines for the management of eye disease in leprosy and on integration of leprosy patients into general eye care services (5). Key components of these guidelines include:

- Creating a strong collaborative relationship between the national leprosy control programme and the national prevention of blindness committee.
- Establishment of 4 key signs to be detected at the time of leprosy diagnosis to guide eye care management and disability prevention. At the time of leprosy diagnosis all patients should be examined for lagophthalmos (any gap in mild closure), visual acuity, the red eye, and presence of a facial patch. All people with lagophthalmos, decreased vision ( $<6/18$ ), persistent red eye (2+ weeks in duration), and/or a facial patch in reaction should be referred by the basic health worker to a higher level for clinical evaluation, or as per guidelines in the national leprosy control and prevention of blindness programmes. It is estimated that approximately 20% of newly diagnosed leprosy patients will require referral to a supervisor or an eye care professional.
- Steps to be taken at the time of discharge from anti-leprosy treatment At the end of anti-leprosy treatment all patients must be educated regarding the risk of eye disease and informed that they should return for examination if they develop lagophthalmos, diminished vision, a red eye, or a facial patch in reaction. Explicit instructions regarding referral must be given to each discharged patient. All patients with lagophthalmos should receive continued periodic follow up.
- Suggested revisions to the current W.H.O. disability grading system for eye disabilities. (see below)

- Strong encouragement to provide cataract surgery with implantation of an intraocular lens, when feasible.
- Adoption of different procedures, other than simple tarsorrhaphy, for the correction of lagophthalmos.

These guidelines serve as a basis for the integration of leprosy patients into the general eye care infrastructure in leprosy endemic countries. Nevertheless, it is recognized that a failure to operationalize the guidelines will lead to the continued poor access to eye care services and continued stigma, poor quality of life, and blindness in leprosy.

### **Disability grading of the eye in leprosy**

Recent research carried out in Tanzania showed significant discordance in the grading of eye disability when done by an eye care professional compared to an integrated health worker (IHW). IHWs recognized 3 people with grade 2 disability while the eye care professional recognized 13 people; similarly the IHW recognized 8 people with grade 1 disability while the eye care professional recognized 60. Improved training could assist with assessment of lagophthalmos and testing of vision, however, without significant efforts and training and provision of instruments, IHW are not going to be able to assess iridocyclitis and corneal opacities.

The current disability grading system for the eyes is impractical for most programmes. Accordingly, it is recommended that visual acuity (either visual impairment [visual acuity <6/18] or blindness [visual acuity <6/60], depending upon the setting) and lagophthalmos should become the primary indicators for monitoring disability (grade 2) and that corneal hypoesthesia, corneal opacities, and uveitis should be removed from the leprosy disability-grading scheme.

### **Lagophthalmos surgery**

Lagophthalmos surgery should be provided to patients who need it. Evaluation of the need for lagophthalmos surgery should be based on one or more of the following

conditions: size of lid gap, corneal exposure, corneal hypoaesthesia, visual acuity, and/or cosmetic difficulties. Research in Egypt (over 300 surgeries) has shown that the modified lateral tarsal strip procedure (6-7) had excellent success; over 80% showed a reduction of lid gap of more than 3 millimeters and complete lid closure was achieved in 50% of eyes. Lid closure was associated with duration of lagophthalmos; the longer the duration the less degree of closure. Less closure was also found in patients with severe lagophthalmos and of an older age. The advantages of the modified lateral tarsal strip procedure were that it was simple, could be carried out in one stage (yet, repeated later, if necessary), it does not require long term follow up or physiotherapy, corrects ectropion and entropion, is cost-effective, and has a cosmetically appealing result. The "Prevention of Blindness" manual (8) will have a section on this procedure. Simple tarsorrhaphy should be discontinued, except in emergency cases. . There are many barriers that prevent patients from accepting lagophthalmos surgery, one of which is the poor cosmetic result of tarsorrhaphy. With the adoption of better surgical techniques, programmes need to be developed to increase the uptake of lagophthalmos surgery.

### **Cataract and cataract surgery**

Cataract related vision loss is higher in leprosy patients than in the general (age-matched) population. Cataract is the leading cause of blindness in leprosy affected persons and many do not have access to general eye care services. Experience in Nigeria has shown that the cataract surgical coverage (% of people receiving surgery among those who need surgery) is generally quite low in leprosy patients. (9) Many patients had opted to have couching performed by itinerant traditional healers; outcomes of this procedure (using a thorn to puncture the cornea and dislodge the lens to the back of the eye) are very poor. The barriers to use of service noted in Nigeria, a similar throughout Africa fall under the headings of awareness (of the service, of where to go, of the expected outcome) , access (high cost of surgery, inadequate transportation network), and acceptance (fear of poor outcome, fear of discrimination by hospital staff, and social support in the family). Improving uptake of surgery requires that surgical management should be carried out in base hospitals rather than as an outreach activity in order to assure high quality of surgery and to manage any surgical complications. This will also, with time, reduce the

stigmatization of leprosy. Similar to the general population, in which “bridging strategies” are successful in increasing access to surgical services leprosy patients need to be brought to the base hospital for surgery. Clear policies regarding subsidies for surgery need to be developed and implemented.

Surgical experience from both Asia and Africa has shown that leprosy patients, even with complicated cataract, can generally benefit from implantation of an intraocular lens. There is no evidence to suggest that post-operative inflammation is more common in patients with a history of chronic uveitis. Not implanting an intraocular lens will, in most cases, result in a patient that is still blind.

### **Integration of leprosy patients into VISION 2020 at the national and district level in Africa**

Integration of leprosy patients into general eye care services can best be accomplished through the development and implementation of national and district VISION 2020 plans. There are a number of steps recommended to achieve integration.

#### 1) Assessment of needs and capacities.

Evidence in Africa would suggest that approximately 10% of newly diagnosed leprosy patients and three times this number of leprosy settlement patients have potentially blinding pathology. These figures can be used to calculate the needs in most African settings. Assessment of capacity for eye care should include listing of ophthalmologists and cataract surgeons by region and compilation of information on routinely used referral practices, in particular the use of “bridging strategies” to identify and get patients to hospital. Skills of integrated health workers in the 4 key signs of ocular leprosy and the skills of eye care providers in lateral tarsal strip procedure for lagophthalmos and implantation of IOL for cataract surgery should also be determined.

#### 2) Establishing a national strategy and national policies

Most every African country has a national prevention of blindness committee (NPBC), comprising the Ministry of Health, NGOs, service groups, and others. The Leprosy Control programme and the NPBC should meet and review the needs assessment and capacities in the country. Together the two should

develop strategies for integrating leprosy patients into general eye care services in the country. Policy decisions regarding such issues as the cost of cataract surgery for leprosy patients and the potential for subsidy and waivers should be determined.

- 3) Clearly defining the training needs required for integrated health workers, supervisory personnel, and the referral eye care providers  
It is anticipated that integrated health workers will need to upgrade training. Also, supervisory personnel, and eye care workers (ophthalmic clinical officers, cataract surgeons, and ophthalmologists) will likely require some upgrade training regarding lagophthalmos surgery. Training should also cover procedures for monitoring uptake of eye care services (primarily cataract and lagophthalmos services), and the outcome of services received.
- 4) Implementing integration at the VISION 2020 planning level  
VISION 2020 implementation planning occurs at the district level; a district being defined as having a catchment population of between 1-2 million people. At this level there is expected to be at least one ophthalmologist or cataract surgeon and a team supporting these individuals. Each district should have a VISION 2020 Task Force. The district leprosy control officer should meet with the Task Force to plan out and implement the integration strategy. The aim is to integrate leprosy patients into the routine system for service delivery, eliminating the need for special structures and personnel for leprosy patients.
- 5) Programme monitoring  
Monitoring should be built into the district VISION 2020 plan whereby the district leprosy control officer can verify eye care coverage and outcome of services.

Strategic planning and implementation are critical tools for leprosy control and prevention of blindness to ensure that persons affected by leprosy are fully integrated into general eye care services in Africa. By doing so it is possible to eliminate avoidable blindness by the year 2020.

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